THE BUILDER

a Journal for the

ARCHITECT & CONSTRUCTOR

Vol. CLIX. No. 5102. Ninety-Eighth Year.

FRIDAY, NOVEMBER 15, 1940

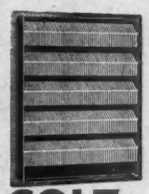
REGISTERED AT THE GENERAL POST OFFICE AS A NEWSPAPER

PRICE NINEPENCE.

TIMBER SHORTAGE.
MARBOLITH
THE IDEAL SUBSTITUTE FOR WOOD FLOORING
Particulars and Samples from:
THE MARBOLITH FLOORING CO. LTD.
29 ALBERT EMBANKMENT, LONDON, S.E.11
RELIANCE 2062-3.

C.E.WELSTEAD Lᵀᵈ
St ANDREW'S WORKS CROYDON
METAL CASEMENTS · LEADED GLASS

WAR EMERGENCY.
BASEMENT SHORES. "BIG BEN" EQUIPMENT FOR PROTECTION OF SKYLIGHTS, PLANT, ETC., AND OTHER AIR RAID PRECAUTIONARY MEASURES.
SCAFFOLDING AND LIGHT SCAFFOLDS FOR ALL PURPOSES.
'Phone Walton-on-Thames 614 and 615



Problem of BLACKOUT VENTILATION solved!
Types for every purpose. Approved by Government Authorities and eminent scientists. Write for brochure.
COLT BLACKOUT VENTILATOR
Colt Ventilation Ltd., 109, Bush House, Strand, W.C.2.

Rolling Shutters, Lifts
IRON DOORS, STAIRS, GATES.
DENNISON, KETT & CO., LTD., Tel.: Reliance 1664
Kenoval House, 226-230, FARMERS RD, LONDON, S.E.5

THE SEYSSEL & METALLIC LAVA ASPHALTE CO.
MR. G. F. GLENN, Proprietor
MOORGATE STATION CHAMBERS, E.C.2.
Telephone · METropolitan 0262.

The STEEL SCAFFOLDING CO. LTD.
"BIG BEN TOWERS,"
23 OATLANDS DRIVE, WEYBRIDGE, SURREY

"DUCK'S BACK" FELT ROOFING
GENERAL ASPHALTE CO·LTD
HOPE HOUSE, GREAT PETER ST·S·W·1
and at
LIVERPOOL & BIRMINGHAM

STEELWORK, FIREPROOF FLOORS
HOMAN & RODGERS
10, MARSDEN ST., MANCHESTER 2
PHONE: BLACKFRIARS 9462 GRAMS: NAMOH, MANCHESTER
SPECIALISTS IN A.R.P. SHELTERS

STEELWORK BY SHARMAN
Also Manufacturers of STEEL GAS AND SPLINTER PROOF DOORS
SWAN WORKS, HANWORTH, MIDDX.
Phones: Feltham 3007, Molesey 1789

BRIGHT'S ASPHALT
LONGWOOD HOUSE, KENLEY LANE, KENLEY, SURREY.

ALDOUS—CAMPBELL LIFTS
TEL.: HOP 2727 (2 lines). LONDON, S.E.1

WALLBOARD SERVICE
MANY TYPES AND SIZES READY FOR IMMEDIATE DESPATCH
PHONE HOP 3611
Walter S. Fry LTD.
106-114 BORO HIGH STREET S.E.1

THE LIMMER & TRINIDAD LAKE ASPHALT CO LTD

ESCALATORS & LIFTS
J. & E. HALL Ltd.
ENGINEERS
DARTFORD, KENT, ENGLAND
Incorporating the business of
MEDWAY'S SAFETY LIFT CO., LTD

A.R.P. STEEL SHUTTERS & DOORS and Steelwork of Every Description
LIGHT STEELWORK
(1925) LTD
Hythe Road, Willesden, London, N.W.10

EVANS LIFTS LTD
ABBEY LANE, LEICESTER.
London Office 66 VICTORIA STREET, S.W.1.
LONDON OFFICE: 10 Nicholson St.
MANCHESTER OFFICE 12 CHARLES ST
A & P STEVENS LTD LIFTS
PROVANSIDE WORKS GLASGOW

RAGUSA ASPHALTE
NOTE TEMPORARY ADDRESS
18 GRANGE ROAD, SUTTON
TELEPHONE—VIGILANT 5687-8-9

THE BUILDER

THE BATH & PORTLAND STONE FIRMS LTD.

Telephone: 3248/9 ABBEY YARD, BATH. Telegrams: "Oolite"

London Office: GROSVENOR GARDENS HOUSE, S.W.1. Telephone: VICtoria 9182/3

PORTLAND STONE ‖ MONKS PARK STONE

TANKS : CISTERNS : CYLINDERS
STEEL BARROWS : BUCKETS
ROOFING FELTS

CROGGON AND Co. LTD.

230, UPPER THAMES STREET LONDON, E.C.4

EST. 1835

Also LIVERPOOL and GLASGOW

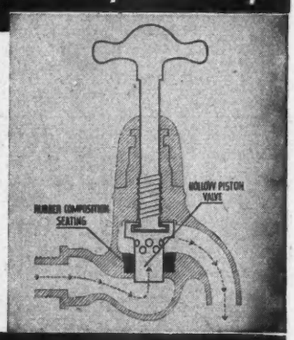
PHONE: CENTRAL 6861/4

LOOK! — a leak-proof Tap

NO DRIPS—
NO WASHER

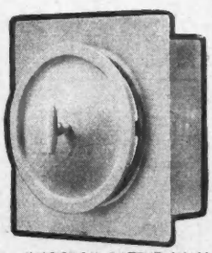
The Evans Washerless Tap is designed on an entirely new principle, a piston valve slides in a special hard rubber composition seating without friction or strain. Hot or cold water. Guaranteed not to leak. Widely used by L.C.C. and other authorities. Tested by B.W.A., M.W.B., etc. All types and finishes. Send for Catalogue.

F. H. Evans & Company,
138 Plashet Rd., Upton Park, E.13.
(GRAngewood 1604.)



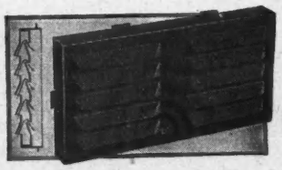
EVANS' WASHERLESS TAPS

"VACAIRE" PATENT EXTRACTOR WITH "NOGAS" VALVE



"NOGAS" PATENT WALL VENTILATOR TYPE WG

NUVAC "NOGAS" PATENT ROOF EXTRACTOR



"NOLITE" PATENT DUPLEX LOUVRE VENTILATOR

GREENWOOD-AIRVAC REGISTERED AIR INTAKE

GREENWOOD-AIRVAC GASPROOF AND BLACK-OUT VENTILATORS.
GAS PROTECTION FOR THE HOME, OFFICE AND WORKS.
INSTANTLY OPERATED AND POSITIVE GAS SEAL.
BLACK-OUT VENTILATORS, MECHAVENT FAN UNITS, AND COMPLETE VENTILATION SCHEMES FOR AIR RAID SHELTERS.
VENTILATORS FOR VEHICLES AND SMALL VESSELS.

PATENTEES · MANUFACTURERS · VENTILATING ENGINEERS

GREENWOOD'S AND AIRVAC VENTILATING COMPANY, LTD.
ABBEYDALE ROAD, NORTH CIRCULAR ROAD, WEMBLEY, MIDDX.
TELEPHONE: PERIVALE 4488 (3 LINES).

RHODES' PATENT PULLEYS AND CHAINS
FOR SASH-HANGING TO PERFECTION
RHODES CHAINS, LTD., ABBEYDALE ROAD, WEMBLEY, MIDDX.
TELEPHONE: PERIVALE 4488 (3 LINES).

THE BUILDER

INCORPORATING

"ARCHITECTURE" AND "THE BRITISH ARCHITECT"

VOL. CLIX NOVEMBER 15 1940 No. 5102

PLANNING

THE limitations of language are such that many a good word can become a snare and delusion when possessed of more than one application. "Planning" is just such a word when permitted to confuse as between the highly technical work of a designer of buildings working at the drawing-board, and the equally technical but entirely dissimilar work of organising a big business, or, say, a military campaign.

It may be no flight of imagination to conceive high powers catching sight of the term "planning" and applying it equally to the rationing of materials, the clearing up of war debris, the replanning of large urban areas and the actual design of buildings, and seizing upon that coincidence as the golden opportunity for unification. If that is really the case, we, as representing architects, may with good grounds view the prospect of the new Ministry's future activities with some misgiving.

This must be taken as no disparagement of Lord Reith, who has already shown such success in versatility that such a suggestion would be not only unjust but would carry little weight among those qualified to judge men and matters. What we mean to suggest is that it is asking too much of any man to throw this last precious egg—the real "planning"—into his one basket, and that a great service to the cause would be rendered if the particular planning of the drawing-board for the actual job were sifted out from the other broader and vaster field of planning which a world-wide, but still temporary, state of war has created. In other words, there seems to have been put under the ægis of the new Ministry too great a diversity of task, and a diversity which needs great leadership from more than one type of brain, each equally important in its own field.

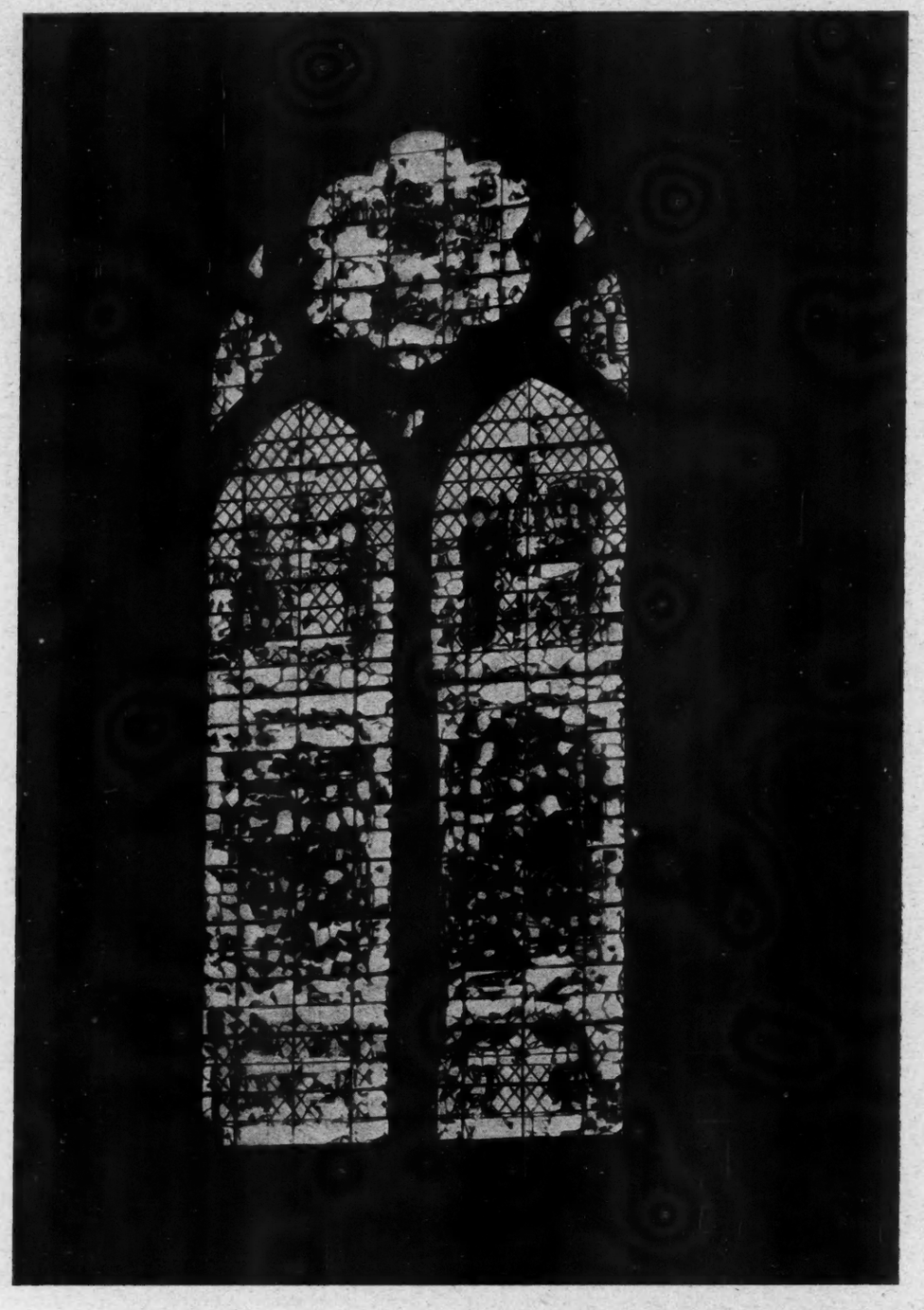
There is much to be said for the view that the control of building materials and the licensing of new building projects ought to be handled by one with a lifelong experience of the essential workings of the building industry. On the other hand, it does not necessarily follow that the work of the Ministry must fail because this requirement has not been met in its Departmental head. But it is quite certain that if the Ministry is to control the shape of rebuilt post-war London, no amount of architectural packing in the subordinate ranks of officialdom will admit success to such a hastily assigned task. It would be fatal if this tragically instituted opportunity for the replanning of the world's greatest city became the genesis of some regimented scheme, depressed with the heavy hand of the bureaucrat; and though we must confess that we can recognise no Wren among us at this time of need, we feel that he would sleep more comfortably if he knew that the ravaged city for which he did so much was being given a new life under competent, even inspired, architectural guidance by numerous men who love their art, than were it a fact that the renaissance of London was being controlled by the bureaucratic machine of Whitehall.

Let us trust, then, that the mere mention of this part of the Ministry's future activities signifies nothing more than the very lightest control and the greatest freedom for those whom we may dare trust with this vitally important work.

If we can indeed lay aside this disturbing fear as lightly as this, we can afford time to consider the other and more specific tasks of the present and immediate future which are to be placed within the control of the Ministry. In this respect, and without forgetting that winning the war is the first and paramount requirement, we suggest that some attempt should be made to render the daily life of the architect, the builder and the citizen as tolerable as an almost intolerable state of affairs will permit.

We cannot expect to carry on a normal existence, nor in particular to build as and how we please, but we can reasonably plead for some co-ordination between the various controls under which we must perforce suffer. In this direction we may look with hope towards a single Ministry to do something to bring reason into the restrictions which must be maintained. For instance, there must be some connection between a permit to build and a permit to draw materials. In other words, if materials are available, permission to build should follow, provided the project is a reasonable one and not damaging to the nation's cause. And permission should be withheld unless it can be followed by access to the materials necessary for its fruition. Yet, we must confess, we shall experience little surprise if a laborious negotiation for the necessary licence is not followed by a disappointing sequel in which no release can be obtained for the bricks and cement and steel required to take advantage of the licence. Of such anomalies is the bureaucratic system made up.

We leave these thoughts with those who must already be engaged in the task of "planning" the future activities of the new Department of State.



RUINED WINDOW IN CHOIR, LIVERPOOL CATHEDRAL.

Early in September German raiders dropped high explosive bombs in the immediate vicinity of Liverpool Anglican Cathedral. Happily no direct hit was obtained, but great damage has been done to the stained glass windows on the South side of the Choir and Lady Chapel. Twelve windows are ruined beyond repair and three are damaged, but reparable. Our illustration, which is given by courtesy of the Cathedral Committee, is of one of the windows in the Choir.

NOTES AND NEWS

London of the Future.

THE replanning of London after the war was discussed at the last meeting of the Court of Common Council of the City of London. A resolution was adopted expressing satisfaction at the recent establishment of a Ministry of Works and Buildings, and drawing the attention of the Government to the urgent necessity of putting into preparation a scheme for the post-war planning of London and other urban areas damaged by enemy action.

The Court as the Town Planning Authority suggested to the Government the desirability of appointing immediately an advisory committee to confer with the authorities concerned and to submit recommendations as to the lines upon which post-war planning should be carried out, and any amendment in the law which might be necessary to secure a simplified and more direct procedure for the replanning, where necessary, of damaged areas.

War-Damaged Buildings.

THE news is now released that Wren's Church of St. Clement Danes has been damaged by a high-explosive bomb which dropped in the roadway and did considerable damage to the north and east sides of the church, especially to the stained-glass windows.

Birmingham Town Hall has suffered some slight damage from incendiary bombs. This building—which celebrated its centenary a few years ago—was designed by Joseph Aloysius Hansom, founder and first editor of *The Builder*.

Fire at Castle Howard.

CASTLE HOWARD, the Yorkshire mansion of the Carlisle family, has been partly burned down and many valuable art treasures destroyed. The fire, which broke out in a bedroom in the east wing, swept along the southern side, destroying the dining-room, the south entrance, and a dome 100 ft. high. The fire brigades prevented the flames from spreading to the west and east wings. Castle Howard was one of the chief works of Vanbrugh.

R.I.A.I. and Hospital Design.

THE following resolution has been passed by the Council of the Royal Institute of the Architects of Ireland at a meeting in Dublin: "That, in view of the increasing unemployment in the architectural profession, and bearing in mind that the funds of the hospital sweepstake have been in existence for many years and so far have not provided an opportunity for the design by competition of hospital buildings, the Minister for Local Government and Public Health be requested to expedite the promotion of the architectural competitions for the design of hospitals already under consideration by the Department."

New President of Civil Engineers.

SIR LEOPOLD H. SAVILE, K.C.B., has been elected President of the Institution of Civil Engineers for the session 1940-41. Sir Leopold, who has had a distinguished professional career, is a partner in the firm of Sir Alexander Gibb & Partners. His works include the design and construction of the Singapore naval base.

PRINCIPAL CONTENTS

ARTICLES — Page

PLANNING 471
BUILDING 4: Mr. Colin Penn and Mr. D. Percival interviewed by R. Myerscough-Walker 474
CORRESPONDENCE: Architects and Ministry of Building 476
WAR-TIME BUILDING PRACTICE—35. SYNTHETICS. By R. Cotterell Butler 483
CONCRETE IN HOUSING. 3.—FLOORS. By Edric Neel, M.A., A.R.I.B.A. 486
EMERGENCY INQUIRY BUREAU 488
NEWS OF FORTHCOMING CONSTRUCTION 489-91
WAGES. PRICES OF MATERIALS 492-3

ILLUSTRATIONS

STRETFORD TECHNICAL COLLEGE. By Stephen Wilkinson, F.R.I.B.A. 477
OFFICE BUILDING, HIGH HOLBORN. By Gordon Jeeves 480
HOUSE AT MINEHEAD. By Edwin Gunn, A.R.I.B.A. 482
BOMBED WINDOW, LIVERPOOL CATHEDRAL 472

William Stewart, M.B.E., F.R.I.B.A.

WE regret to record the death, on November 1, of Mr. Wm. Stewart, M.B.E., F.R.I.B.A., of 90, Fenchurch-street, E.C. Mr. Stewart, who was in partnership with Mr. H. D. Hendry, F.R.I.B.A., had an extensive practice in public-house designing, in which direction he was a recognised expert.

G. C. Widdowson, F.S.I.

WE regret to record the death of Mr. George Clifford Widdowson, O.B.E., Chief Quantity Surveyor to H.M. Office of Works. Mr. Widdowson was for many years a member of the Quantity Surveyors Committee of the Chartered Surveyors' Institution.

T. E. Marshall.

MR. THOMAS EDWARD MARSHALL, of Harrogate, senior partner of Messrs. Marshall and Storey, has died in his 81st year. Mr. Marshall was trained as an architect, and began practising at Harrogate 50 years ago. With his father he was one of the architects who originally planned the Valley Gardens, and he was associated with the erection of many principal buildings in the town.

COMING EVENTS

Tuesday-Friday, November 26-December 13.—Architectural Association. Annual Exhibition of Photographs by Members.

Tuesday, November 19.—Housing Centre Luncheon: Mr. H. G. Griffin, on "War-Time Activities of the C.P.R.E." 1 p.m.

Tuesday, November 19.—Institution of Civil Engineers. Mr. William Barnes on "Methods of Excavation Work at Home and Abroad." 1.30 p.m.

Tuesday, December 3.—Housing Centre. Luncheon: Mr. R. M. Titmuss, on "The Casualties of Environment." 1 p.m.

Wednesday, December 4.—Royal Society of Arts. Mr. D. E. E. Gibson on "Problems of Building Construction." 1. 45 p.m.

The R.W.A. School of Architecture.

THE R.W.A. School of Architecture has removed, for the war period, to the Royal West of England Academy, Queen's-road, Bristol, 8.

"Reconstruction."

MR. J. E. RHIND, A.R.I.B.A., Dipl.Arch. (Aber.), has reprinted under this title a number of the letters, etc., which he has contributed to the Press, some of which have appeared in our own pages. Though on a variety of aspects of architecture and building, they all emphasise the urgent need for better standards of planning, design and building, and the importance of employing competent architects for the work. They make excellent reading at a time when the creation of a Ministry of Building has turned the thoughts of many to the great possibilities of replanning and an improved social order at the end of the war.

Professional Announcements.

MESSRS. H. V. ASHLEY AND WINTON NEWMAN, FF.R.I.B.A., are working at their Hampstead office, No. 2, Lyndhurst-terrace, Lyndhurst-road, N.W.3 (telephone: Hampstead 6682), where all communications should now be addressed. Interviews can be arranged by appointment at 14, Gray's Inn-square, preferably on Tuesdays and Thursdays.

MESSRS. GUNTON AND GUNTON, FF.R.I.B.A., have reopened their Liverpool office at H 23, Exchange-buildings, and would be grateful to receive recent trade catalogues and circulars.

The partnership which has for some time past been carried on by MR. CHARLES BERESFORD MARSHALL and MR. LIONEL HUGO FEWSTER, at 41b, Chagford-street, Dorset-square, London, N.W.1, was dissolved by mutual consent on September 30 last. Mr. Marshall is now on active service with the Royal Air Force, but will resume practice after the war. Mr. Fewster will practise on his own account at 41b, Chagford-street, N.W.1, under the style of LIONEL H. FEWSTER AND PARTNERS.

MESSRS. VICTOR CULLEN AND SONS, surveyors, announce that owing to their offices at 10a, Great Portland-street, being demolished by enemy action, they have moved to 44, Berners-street, London, W.1 ('phone: Mus. 1650).

IN 1915.

EXTRACT FROM *The Builder*, NOVEMBER 12.

THE President [Mr. H. Austen Hall] said he wished briefly to review the position of the Association at the present time. They had carried on a very successful recruiting work which had been the great work of the Association since the war began. They had now recruited over 1,000 men for the Army, and 400 men of the Association were now serving. They had also a large Committee under the control of Mrs. Maurice Webb for providing comforts for the men, and this Committee had sent out comforts, food and clothing, and, in fact, anything the men asked for, whether they were in France or the Dardanelles, or India, or elsewhere.—*Extract from proceedings of the annual general meeting of the Architectural Association.*

The Industry's Leaders on

BUILDING: ITS PLANNED DEVELOPMENT

A SERIES OF INTERVIEWS WITH R. MYERSCOUGH-WALKER

No. 4—COLIN PENN, P.A.A.S.T.A., AND DAVID PERCIVAL, A.R.I.B.A.

NOTE BY R. MYERSCOUGH-WALKER.

THIS is the fourth attempt to define by conversations the present state of the Building Industry, and I had hoped that the Association of Architects, Surveyors and Technical Assistants, consisting as it does of young men, would have given the fillip which I felt necessary to the series. I believe I have mentioned somewhere the hesitancy on the part of the Presidents of the professional and other institutions in the industry to speak plainly, and in High Holborn there are the offices of this group, the A.A.S.T.A., which consists of young people such as Penn, Percival, Blanco White, Pinckheard, etc., who constitute what I suppose could be described as the left wing in architectural politics. They appear to have a grudge against the more conservative bodies, and in general I am inclined to agree with their ideas, although I am loth to join any group which puts a label on itself and, as the label becomes more important, moves gradually from the left point of view to a conservative body no better than the preceding and old-fashioned groups.

Beyond that, of course, is the fact that most "left" ideas spring from young people who see in a rather naive way the injustices that exist in our present system and believe in their abolition at one fell swoop, much in the way that was suggested by a young man to me last night, who said he would like to go into the R.I.B.A. with a revolver and shoot everybody over 50. I have little use for such idealism. Much as I dislike, and I hope always will, the conservative element which exists —and particularly the results which the capitalistic system has shown it has to produce—I cannot see this idealism working at all unless the person or persons attempting it have a very profound knowledge of the existing machinery. Karl Marx's book "Das Kapital" and the Webbs' analysis of the same subject, and to a lesser degree George Bernard Shaw's interesting book on Socialism, Capitalism and Fascism, show a deep knowledge of the existing machinery and how it can be overcome, or even used towards a better end.

It is therefore with some—I was going to say—disappointment but instead will use abated enthusiasm, that I write down the answers which were given to me by Colin Penn and David Percival. I found them both intelligent; certainly their intentions are of a fine order, and the way in which they are diverting these intentions is towards technical advice. This appears to be the main function of the Association, and it is possible that the questions and answers which follow will emphasise this and give some idea as to their point of view. The replies were not taken down verbatim, but have been written by me since our meeting. They consist roughly of the questions which have been put to other Presidents and run as follows :—

Interview with COLIN PENN (President) and D. E. PERCIVAL (Chairman of Council).

1. Are you satisfied that architects, surveyors, contractors, etc., are making the best possible contribution to the national war effort?

ANSWER: No.

2. In what way are they falling short of their maximum contribution?

ANSWER: The present system offers no incentive to such a contribution. Those architects who are not in the army are subordinated to engineers, leading to waste and bad planning. The vicious cost-plus-profit system short-circuits some of the quantity surveyor's most necessary work. The de-reservation of the architectural profession means that architects are not available for such urgent work as air-raid shelters and evacuation buildings.

3. What form of better co-ordination of effort in the interests of the national war effort would you suggest?

ANSWER: It is doubtful whether the building industry as it is can be better co-ordinated, because it is organised for private profit. We agree with the building workers who protest against the present inefficiency and say that the only way out is nationalisation under democratic control.

4. What direction do you think better organisation or co-ordination between the organised sections and the Government Departments concerned with the war effort should take?

ANSWER: Better co-ordination is made impossible by the basic faults of the system. To make money is its chief object, and the building industry may therefore, from that point of view, be regarded as 100 per cent. efficient!

5. Do you think a more comprehensive form of liaison between architects, surveyors, etc., and the Government as a whole is desirable?

ANSWER: So far the Government has ignored sound technical advice. This suggests a change of Government. The new Ministry will not solve the problem because ministers carry out the policy of the Government; they are not persons who have policies of their own.

6. Do you think that one single Department for dealing with all building matters (there are now seven or eight Departments concerned with building activity), will be a proper measure of administrative simplification and an advantage from both the national and the industry's point of view?

ANSWER: Abstractly, yes; but it depends in practice on the administrators and their purpose.

7. Do you think the purpose of the building and associated professions would be better served by a Ministry of State (such as the Ministry of Works and Buildings) or by the extension of an existing Department (say, H.M. Office of Works)?

ANSWER: This is a question of detail which must be subordinate to major questions of policy.

8. Do you think that the following matters should come under the control and administration of the new Ministry?

(*a*) Town planning; (*b*) Housing; (*c*) Location and siting of industries; (*d*) By-laws and building regulations; (*e*) Standards of quality and dimensions; (*f*) Research; (*g*) Training and entry into industry; (*h*) Technical education and instruction.

ANSWER: It seems obvious that the new Ministry must include (*a*) to (*f*), but we see no reason why (*g*) or (*h*) should be excluded from the general system of technical education—which itself needs revolutionising. Links with industry would, of course, be necessary.

9. Do you think that long-term policies of public works development, including such matters as the provision of the highest possible structural standard and accommodation of schools, hospitals and associated clinics, social amenities and public administrative centres generally, should come within the purview of the Ministry?

ANSWER: Yes.

10. Do you think a long-term policy and programme of public works development is in the national interest, and, if so, for what reason?

ANSWER: Yes, for obvious reasons.

11. Do you think that a widespread Colonial development policy based on public works and services programmes for the Colonies is a matter which should come within the scope of the Ministry of Works and Buildings?

ANSWER: We believe that such a programme is very necessary in the Colonies; that they should be allowed to state their needs to their own Minister of Building, to which we could very well give technical advice based on our own experience.

12. Do you think that a policy for the development of British building in foreign

countries should be a proper subject for development by the Ministry of Building?

ANSWER: One more possible cause of war.

13. Do you think that fostering the exportation of British building materials to all parts of the world should become the concern of a Ministry of Building?

ANSWER: At present there is no surplus of building materials. No doubt such products are being and will be exported, but at the expense of our own urgent needs.

14. What form of contact between the building industries and the Ministry of Works and Buildings do you think would best suit national ends? Do you think, for instance, that representatives of the building group of industries should be a recognised part of the Ministry?

ANSWER: The Ministry should not be controlled by the building industry. We believe in control by and in the interest of the consumer.

15. Do you think it would exercise a progressive influence on building development if the building industry had available to it such a Ministry of Works and Buildings as would enable industry to put forward proposals for dealing with matters of difficulty or for the further development of trade?

ANSWER: No; not as the industry is at present organised.

THE INTERVIEW CONTINUED.

[NOTE BY R. M.-W.: This was the extent of the questions which have been put to other Presidents, and in the eyes of Messrs. Penn and Percival the questions led nowhere. These questions, I must now confess, were not of my own composition, therefore they are to some extent rather impersonal. What I did from this point was to carry on with questions of my own.]

R. M.-W.: In this series so far is complete divergence. The young element has not been represented up to this moment. You, to some extent, represent it, and it interests me to know what you would do, given a free hand.

P. and P.: It has been suggested that the new Ministry will give young planners a free hand, a thing we cannot believe. However gifted the planners and however good their intentions, they will inevitably be subordinated to a policy which will not allow them to pass the limits of the present system.

R. M.-W.: You could divert a group of planners, engineers, educationists, etc., and allow them to research and to make known their results.

P. and P.: Scientists have been used by the Government for research, but their results are not made known if they conflict with the Government's policy. Lord Horder's committee examined the problems of health in air-raid shelters. The report has not been published.

R. M.-W.: Taking this point of view, then, you may both as well retire right now from the scene of architectural industry.

P. and P.: Certainly not! Our Association has never been so active before. If the Government doesn't accept our research we must find others who will. One doesn't start then at Whitehall, but rather at Bethnal Green.

R. M.-W.: In short, you must forget architecture and turn to politics for the time being.

P. and P.: On the contrary, we intend to stand on technical grounds and carry on research into such problems as A.R.P., Evacuation, and Rehousing. We have found up to the present time, that our advice, confirmed by other experts, has been rejected. If sound advice backed by popular support is rejected by the Government, the issue becomes at once political, but that is not our fault.

R. M.-W.: Why, then, has the Government not taken the advice of people like yourselves?

P. and P.: That is a question to which we ourselves would like the answer. Does it suggest that the existing profit-structure stands in the way?

R. M.-W.: Taking the shelter problem as one aspect, can't the building industry make a profit out of air-raid shelters?

P. and P.: There is more profit in other fields, at least for the large builders. And other interests, such as heavy engineering and armaments, have greater influence in the Government than the building industry.

As regards materials, profits can in many cases be maintained only by restricting production; for to produce the maximum amount of materials would lower the cost. It is better, for instance, to close certain cement works and maintain the price of cement rather than to keep them open and be faced with surplus capacity when demand ceases.

R. M.-W.: You suggest starting at Bethnal Green. What do you start there?

P. and P.: We consistently put forward the technical advice which is required. If this advice meets the need, it is accepted and support in that way obtained. We believe that in this way our Association is laying a sure foundation among working people who previously hardly knew what an architect or surveyor was. And, in our opinion, these are the people who matter.

R. M.-W.: Supposing that the inhabitants of Bethnal Green were evacuated to South Wales by the Government. What then?

P. and P.: Certain people—chiefly children—should certainly be evacuated, but under a well-organised scheme, such as we have suggested. If the others are provided with proper protection, evacuation will be unnecessary.

R. M.-W.: To take a new point of view, what is happening about absorption of young architects into such services as engineering? Do you favour the profession being reserved?

P. and P.: That question is answering itself. The stupid error of dereservation is now clear, and architects whose talents are vitally necessary are being forced into positions where it appears they are trying to avoid military service by calling themselves engineers!

R. M.-W.: What about the more creative side of architecture?

P. and P.: War is destructive, not creative.

R. M.-W.: Could not the war-time structures which are being built be better designed?

P. and P.: Easily. See, for instance, some of the designs by our own Evacuation Committee.

R. M.-W.: Isn't intelligent factory design, for instance, creative?

P. and P.: Yes, but there is not a chance while the old departmental system insists on the use of a standard plan unaltered since the Boer War.

R. M.-W.: But you originally put the war as a reason for there being no creative work. Now you say it's the Government!

P. and P.: It is impossible to separate one from the other.

R. M.-W.: If Government Departments could be organised, then intelligent architecture would be possible even in war time?

P. and P.: Yes, if they could be organised. Architects disguised as engineers are at present doing some quite good work under very difficult conditions.

R. M.-W.: Lord Reith has been put in charge of the new Ministry; he could accomplish a change in these Departments. Have you any comment to make?

P. and P.: Ministers are bound to carry out the policy of the Cabinet, so their hands are tied.

R. M.-W.: All this seems to be rather defeatist on your part.

P. and P.: No, not at all; we are full of optimism. If we were defeatist we should not be working as hard as we are! We are not afraid to face the necessity for a change in the present system.

R. M.-W.: What of architecture itself?

P. and P.: At the beginning of the war the profession sank to its lowest level. We believe that by our research and practical work public esteem is being gained once more. But it is a new kind of esteem and a new public.

R. M.-W.: Don't you think it is high time that people who are to build in the future were trained differently? The schooling of the architect and the builder seems remote one from the other. If you like, the Frank Lloyd Wright School in Arizona and Gropius's ex-Bauhaus in Germany can be taken as two excellent examples.

P. and P.: An understanding of problems by those who design and those who build is obviously desirable.

R. M.-W.: In other words, a levelling up of all the jobs in building, so that each participant is aware of the other's knowledge?

P. and P.: The architect was created by the division of labour, and is obviously derived from the master builder. It is time that reintegration took place, with everybody in the building industry understanding everybody else's job.

R. M.-W.: What do you hope to get ultimately from your present energies?

P. and P.: We believe that those architects who serve the community now will be the architects who will be called on after the war. The education we are getting now will enable us to undertake larger tasks in the future.

(To be continued.)

Timberless Houses, Scotland.

Unwilling to suspend the building of houses for slum clearance owing to the war-time shortage of timber, Paisley Housing Committee are trying out an experiment—that of timberless houses. Two blocks of houses have been built entirely without wood, having walls of brick and roughcast and flat roofs, with cement joists down to slate window sills. Members of the Town Council have inspected the houses and, providing they meet with approval, a large number will be erected.

ARCHITECTS REGISTRATION COUNCIL

34TH ORDINARY MEETING.

MR. SYDNEY TATCHELL, F.R.I.B.A., took the chair at the 34th ordinary meeting of the Architects Registration Council, held at 66, Portland-place, on October 25. Before business began, MR. HUBERT LIDBETTER presented to the Chairman, on behalf of the Council, a copy of the bound proceedings of the Council for the past four years, and inscribed "Presented to Sydney Tatchell, F.R.I.B.A., by his colleagues, in token of their esteem and in recognition of his services as their Chairman, 1936-40."

MR. A. H. MOBERLY moved (and MR. W. O. HUDSON seconded) "that the Council approve the action of the Chairman in summoning the Emergency Committee to deal with the business of the Finance and General Purposes Committee and the Professional Purposes Committee, such members of these committees respectively as desired to attend being invited to do so, and that the precedent be followed in future cases so long as war conditions rendered it difficult to summon the ordinary Committees." This was agreed to.

A recommendation of the Emergency Committee that any items in the agenda for the current meeting be remitted for decision to the Emergency Committee, if not disposed of by 4 p.m., was agreed to, subject (on MAJOR ATHOE'S proposal) to any member of the Council who so desired being permitted to attend for the business which affected the Council.

ADMISSION COMMITTEE.—Mr. Geoffrey Wilson's resignation as Chairman of this Committee was accepted with regret, Mr. Wilson having accepted a position under the Government. Four hundred and ten persons recommended for admission to the Register were admitted and 33 applications refused.

The Committee recommended the following Regulations be submitted for approval to the Privy Council: "A person shall be eligible to apply for registration under the Principal Act (6) if he was in the Armed Forces of the Crown (other than the Home Guard) at any time between January 1 and August 1, 1940, provided that he applies for registration within six months after demobilisation or discharge and provided also that he would have been qualified for admission under Section 2 of the Architects Registration Act, 1938, or under paragraph (2) or (5) of this Regulation if he had made application before August 1, 1940."

The Council approved the recommendation and remitted it for confirmation to an intermediate meeting of the Council.

The following motion, put by the Chairman, was approved: "That the Finance and General Purposes Committee be requested to consider the position of architects in *bona-fide* practice of long standing, not qualified for registration by examination, who failed to apply for admission to the Register before the statutory closing date, August 1, 1940, and to consult the Admission Committee before making any recommendation to the Council."

Applications under the 1938 Act and under Regulations 26 (2) and (5) numbered 5,142. Of these, 2,068 had been recommended for admission and 132 rejected. 2,942 were still to be dealt with.

Mr. W. O. Hudson (*vice* Mr. E. W. Chapman) and Mr. L. H. Bucknell (*vice* Mr. B. P. Westwood) were appointed to the Committee.

EMERGENCY COMMITTEE (PROFESSIONAL PURPOSES).—Several cases arising out of the Code of Professional Conduct were dealt with.

EMERGENCY COMMITTEE (FINANCE AND G.P.).—MR. DARCY BRADDELL, in presenting this report, stated that the Scholarship Fund showed a balance, there being excess of income over expenditure amounting to £,539.

It was stated that 416 persons had not paid their retention fees for the year; twelve of these were architects who pleaded unemployment and hardship arising out of the war. It was agreed that these cases be examined by the Finance Committee, who would report to the Council.

BOARD OF ARCHITECTURAL EDUCATION.—Mr. A. MINOPRIO reported that one of the scholarship holders was called up for military service but registered as a conscientious objector. After considerable discussion a resolution by Mr. A. H. MOBERLY to the effect "that the scholarship of any person registered as a conscientious objector be suspended for the duration of the war" was declared carried.

CORRESPONDENCE

[While we are glad to publish letters on professional and other matters of interest to our readers, it must be understood that we do not necessarily endorse the remarks of correspondents, who will oblige us if they will express their views as briefly as possible.]

Architects and the Ministry of Building.

TO THE EDITOR OF *The Builder*.

SIR,—The human race has not, I imagine, been invented for the glorification and pecuniary advancement of the architectural tribe, any more than it has been invented for the purpose of increasing the emoluments of the chimney sweep, or the racing tipster, or perhaps even the B.B.C. announcer. On the contrary, these and other tradesmen have come into existence as a result of social needs and wants.

Attempts by architects, collectively or individually, to exalt themselves into demi-gods remind one irresistibly of the frog which attempted to blow itself up to the dimensions of an ox. The end of this fable was, I believe, not so good.

I am not personally acquainted with Lord Reith, but as I believe he is an educated man and a Scot to boot, I see no reason for assuming that he will be unable to appreciate fine architecture should he meet with it, or to demand it if it is not produced.

Writing for the moment as a layman and not as a member of the aforesaid architectural tribe, I wish to state that I resent being grossly insulted by architects kindly informing me that I am unable to appreciate their wonderful works. Should I swallow the insult, however, I find my intelligence further insulted by being invited, quite calmly and casually, to elect my insulter to supreme power, and, to add injury to insult, I am to pay his fees!

The architect, in his arrogance, is to tell me the kind of house or dwelling I may inhabit; he is to tell me the kind of city or town I may live in, and, if he can get away with it, he will no doubt proceed to decree whether I may share a double bed with the wife of my bosom or suffer a kind of architectural divorce by sleeping in one of two architecturally designed built-in single bedsteads.

Away with all this nonsense!

One last sentence culled from my old copybook: "Self praise is no recommendation," not even for architects.

J. A. PIRIE,
Registered Architect.

37, Victoria-avenue,
Stockton Heath,
Warrington, Lancs.

Economies in Timber.

A special economy branch of the Ministry of Supply Timber Control is saving timber at the rate of 350,000 tons a year, in addition to the economies achieved through cutting down supplies for non-essential purposes. Great economies in timber have been made by the substitution of fibre-board cases for wooden ones, and by the use of open crates instead of closely jointed cases. The lapping-boards on which textiles are rolled have been replaced by a light framework, which saves something like 15,000 tons of timber a year.

OFFICIAL SHELTER POLICY

A.R.P. CO-ORDINATING COMMITTEE'S CRITICISMS.

A CONDEMNATION of the shelter policy outlined by Mr. Herbert Morrison on November 3, and comprehensive alternative proposals for bombproof shelters, are contained in a letter sent on November 4 to Mr. Morrison by the A.R.P. Co-ordinating Committee. The main points from the letter are as follows:—

The Committee, recalling Mr. Morrison's previous advocacy of bombproof shelters, regret that he proposes no basic changes in A.R.P. policy, and express concern particularly at the shelter position. The dispersal policy of small shelters, on which the whole official scheme is based, is completely fallacious. For a given expenditure large shelters are far safer than small ones. Mr. Morrison's rejection of the idea of the universal provision of deep shelters will cause widespread misapprehension, for he took no account of the other forms of bombproof shelter which are not deep but which must play a large part in any national programme.

The Committee's proposals are for fully bombproof protection, the form to vary from area to area in accordance with the local possibilities. Each of the following types of shelter will have to play a part:—

Reinforced concrete shelters, entry above or below ground and holding up to 1,000 people each. The "Haldane" shelter is an outstanding example of this type.

Large multi-storey reinforced concrete shelters for densely populated areas. Each can hold many thousand people at a very economical figure for cost and materials. The reason given by the Government for rejecting this type of shelter (difficulty in reaching them in time) has been refuted by the experiences of the London Tubes.

Adaptation of further existing tunnels as shelters and their extension. The tunnels from the London Tubes could reasonably be expected to provide additional accommodation for some 10,000 to 13,000 people per week.

New tunnels where soil and conditions are favourable. The Easington Rural District Council has started a system of tunnels in the near-by limestone hills, at a cost, inclusive of lighting, mechanical ventilation and sanitary conveniences, of about £8 per head.

Shelter Amenities.

With regard to facilities in existing and new shelters, a strong case is made not only for bunks, but for mechanised ventilation, far better sanitation, canteens, first-aid and isolation rooms, and provision for the disinfection of clothing and bedding. All these are essential if the health of the nation is to be safeguarded from the spread of disastrous epidemics.

With regard to the materials necessary for shelters, there must be a drastic modification in the priority system (only 11,000 tons of steel out of a productive capacity of 13 million tons was allocated to A.R.P.). The manufacture of Portland blast-furnace cement should be introduced which, with certain other steps, could raise production by some 75 per cent., although the resistance of certain vested interests would have to be broken down.

There should be a considerable decentralisation of the warning system, and the powers of observation of roof spotters should be supplemented by information from the official and properly equipped listening posts.

Fens Flooding Protection.

The Ouse Catchment Board is to be advised by its special committee which has been considering Sir Murdoch MacDonald's £3,800,000 design to protect the fens from flooding, to accept a modified scheme estimated to cost £1,700,000. This plan provides a cut-off channel from Denver to St. Germans instead of from Cambridge to St. Germans.

STRETFORD TECHNICAL COLLEGE, LANCS.

MR. STEPHEN WILKINSON, A.F.C., F.R.I.B.A., COUNTY ARCHITECT.

DETAIL OF BRONZE ENTRANCE DOORS.

THIS College occupies a prominent position close to the Town Hall and faces on to a busy thoroughfare, from which it is well set back.

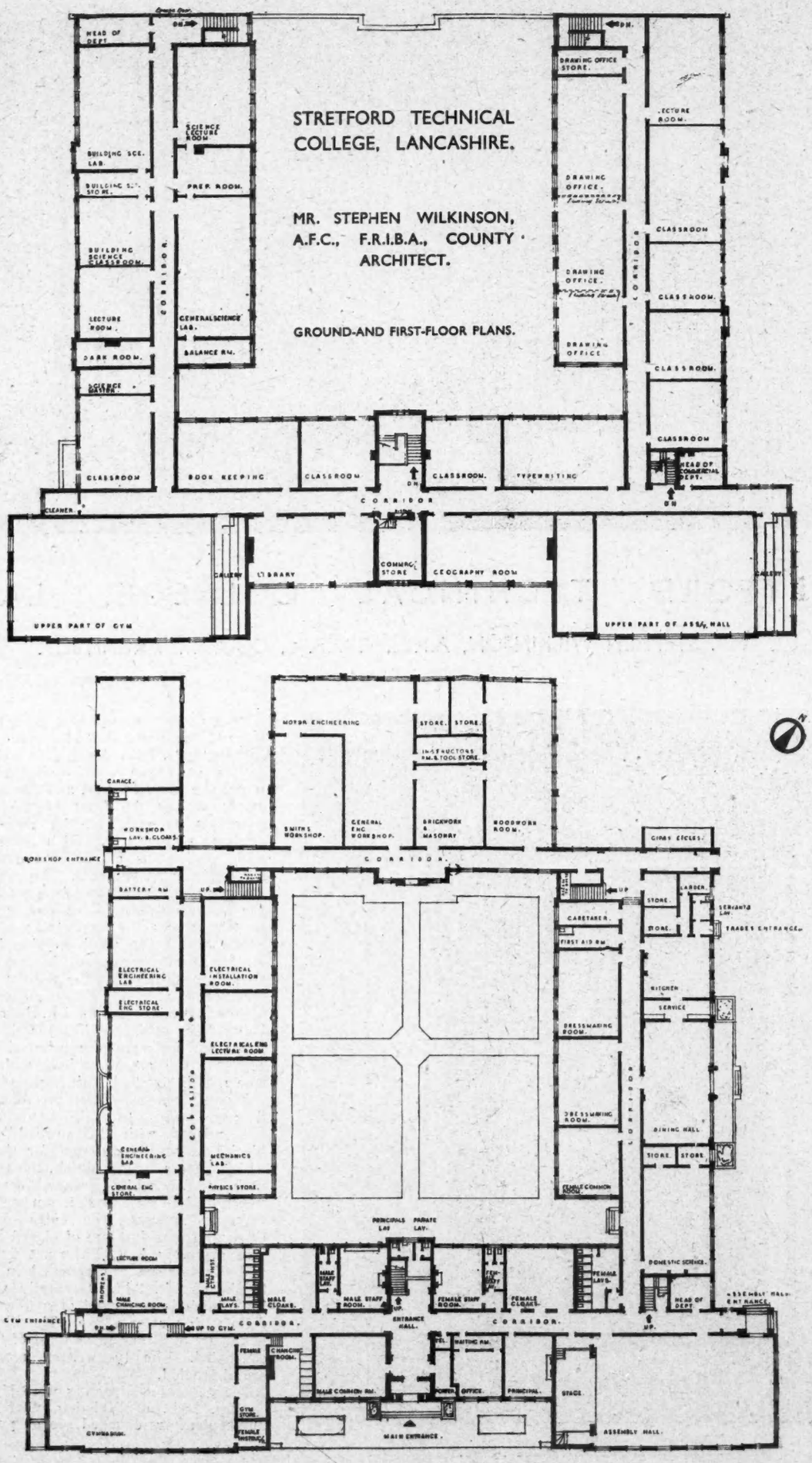
PLANNING.—The main entrance is placed under the central tower, and the administrative offices occupy the front of the College with entrances at each side for male and female students respectively, and a separate entrance with cloakrooms adjoining the workshop for the engineering students. The gymnasium and assembly-hall form two wings set forward from the main entrance. The engineering department occupies the south side of the central court, whilst the north portion houses dressmaking, dining-rooms and kitchens. The workshops are situated at the rear of the building and permit of possible future extensions.

CONSTRUCTION.—Is of brick, the external walls being 16-in cavity with stone dressings. The floors and flats are of reinforced concrete, except for the assembly hall and gymnasium. The roof is finished with green pantiles.

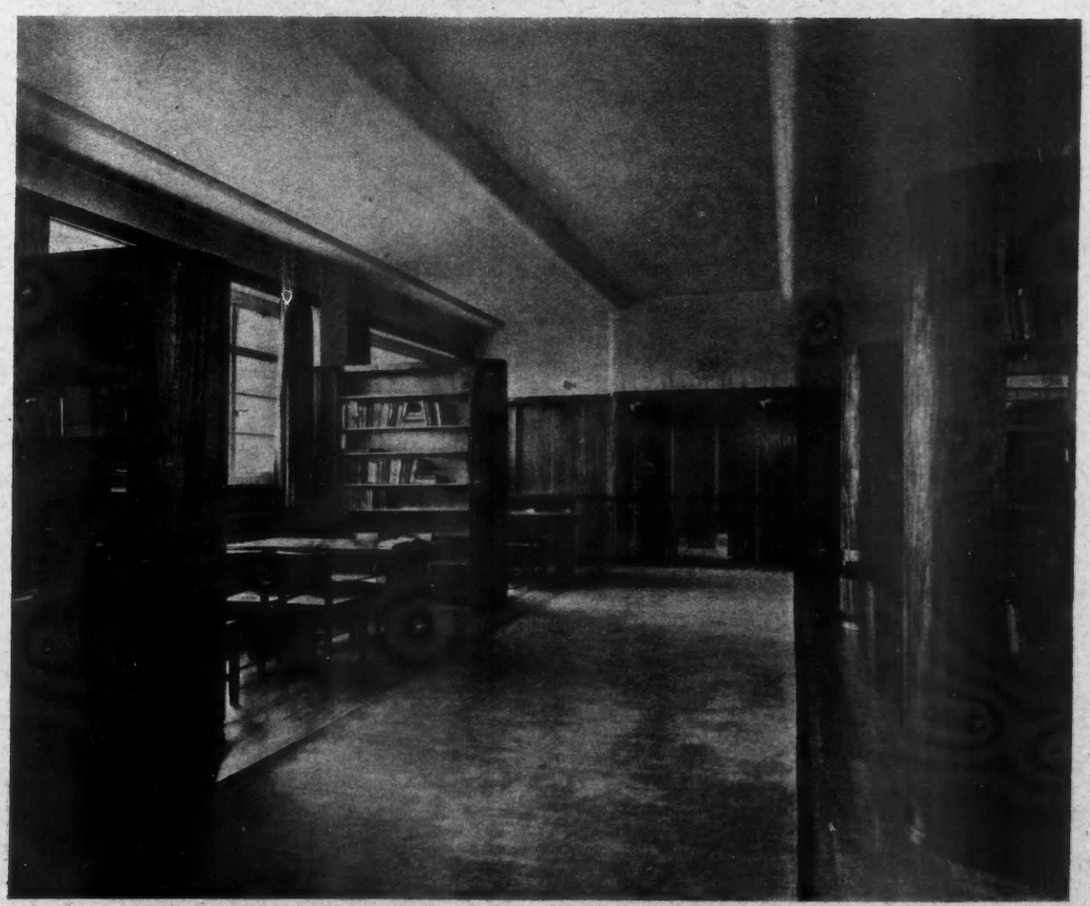
FLOOR FINISHES.—The floors of the corridors, domestic science room, kitchen and cloakrooms are finished with "Granwood" composition blocks. Elsewhere, except for the workshops, which have a cement finish, the rooms are laid with British white Borneo flooring and the assembly hall and gymnasium with oak.

WALL FINISHES.—The entrance hall, staircases and corridors are of glazed faience slabs. The assembly hall, library, principal's room and dining-room are panelled in walnut to a height of 7 ft. 3 in. Generally elsewhere the wall finish is composed of a 3-ft. 6-in. cement dado with plaster above. The library lighting is worthy of attention as most of the lights are concealed. The typewriting room has been sound-proofed.

The general contractors were Messrs. James Cocker, Ltd., of Walkden, near Manchester. Sub-contractors engaged are on page 490.


STRETFORD TECHNICAL COLLEGE, LANCASHIRE.
MR. STEPHEN WILKINSON, A.F.C., F.R.I.B.A., COUNTY ARCHITECT.
GROUND-AND FIRST-FLOOR PLANS.
HEAD OF DEPT
SCIENCE LECTURE ROOM
BUILDING SCE. LAB.
PREP. ROOM.
BUILDING SCIENCE CLASSROOM
LECTURE ROOM
GENERAL SCIENCE LAB.
DARK ROOM.
BALANCE RM.
CLASSROOM
BOOK KEEPING
CLASSROOM
CLASSROOM.
TYPEWRITING
CORRIDOR
CLEANER
GALLERY
LIBRARY
COMMG. STORE
GEOGRAPHY ROOM
UPPER PART OF GYM
UPPER PART OF ASS'Y. HALL
DRAWING OFFICE STORE.
DRAWING OFFICE.
DRAWING OFFICE.
DRAWING OFFICE
LECTURE ROOM.
CLASSROOM
CLASSROOM.
CLASSROOM.
CLASSROOM
HEAD OF COMMERCIAL DEPT.
GARAGE.
WORKSHOP LAV. & CLOAKS.
MOTOR ENGINEERING
STORE.
STORE.
INSTRUCTORS RM. & TOOL STORE
SMITH'S WORKSHOP.
GENERAL ENG. WORKSHOP.
BRICKWORK & MASONRY
WOODWORK ROOM.
GIRLS' TOILETS.
WORKSHOP ENTRANCE
CORRIDOR
BATTERY RM.
UP.
ELECTRICAL ENGINEERING LAB
ELECTRICAL ENG STORE
ELECTRICAL INSTALLATION ROOM.
ELECTRICAL ENG LECTURE ROOM
GENERAL ENGINEERING LAB
GENERAL ENG STORE.
MECHANICS LAB.
PHYSICS STORE.
LECTURE ROOM
SHOWERS
MALE CHANGING ROOM
MALE LAVS.
MALE CLOAKS.
MALE STAFF LAV.
MALE STAFF ROOM.
PRINCIPALS LAV.
PARENTS' LAV.
FEMALE STAFF ROOM.
FEMALE CLOAKS.
FEMALE LAVS.
GYM ENTRANCE
UP TO GYM.
ENTRANCE HALL.
FEMALE
CHANGING ROOM.
GYM STORE.
FEMALE INSTRUCTRESS
GYMNASIUM
MALE COMMON RM.
WAITING RM.
OFFICE.
PRINCIPAL.
MAIN ENTRANCE.
STAGE.
ASSEMBLY HALL
UP.
CARETAKER.
FIRST AID RM.
DRESSMAKING ROOM.
DRESSMAKING ROOM.
FEMALE COMMON ROOM.
STORE.
LADDER.
SERVANTS LAV.
STORE.
TRADES ENTRANCE.
KITCHEN
SERVICE
DINING HALL
STORE.
STORE.
DOMESTIC SCIENCE.
HEAD OF DEPT
ASSEMBLY HALL ENTRANCE.
N

THE ENTRANCE HALL. *Below*: THE LIBRARY.



STRETFORD TECHNICAL COLLEGE, LANCS.

MR. STEPHEN WILKINSON, A.F.C., F.R.I.B.A., COUNTY ARCHITECT.

OFFICE BUILDING, HIGH HOLBORN.

MESSRS. GORDON JEEVES, ARCHITECTS.

The rebuilding of Nos. 271, 273, 275 and 277, High Holborn, was designed by Messrs. Gordon Jeeves, the design for the structural work being carried out by Mr. S. Bylander and the designs for the mechanical and other services by Messrs. J. Stinton Jones and Partners. The contractors were Messrs. E. Pollard and Co., Ltd., of St. John Street, Clerkenwell.

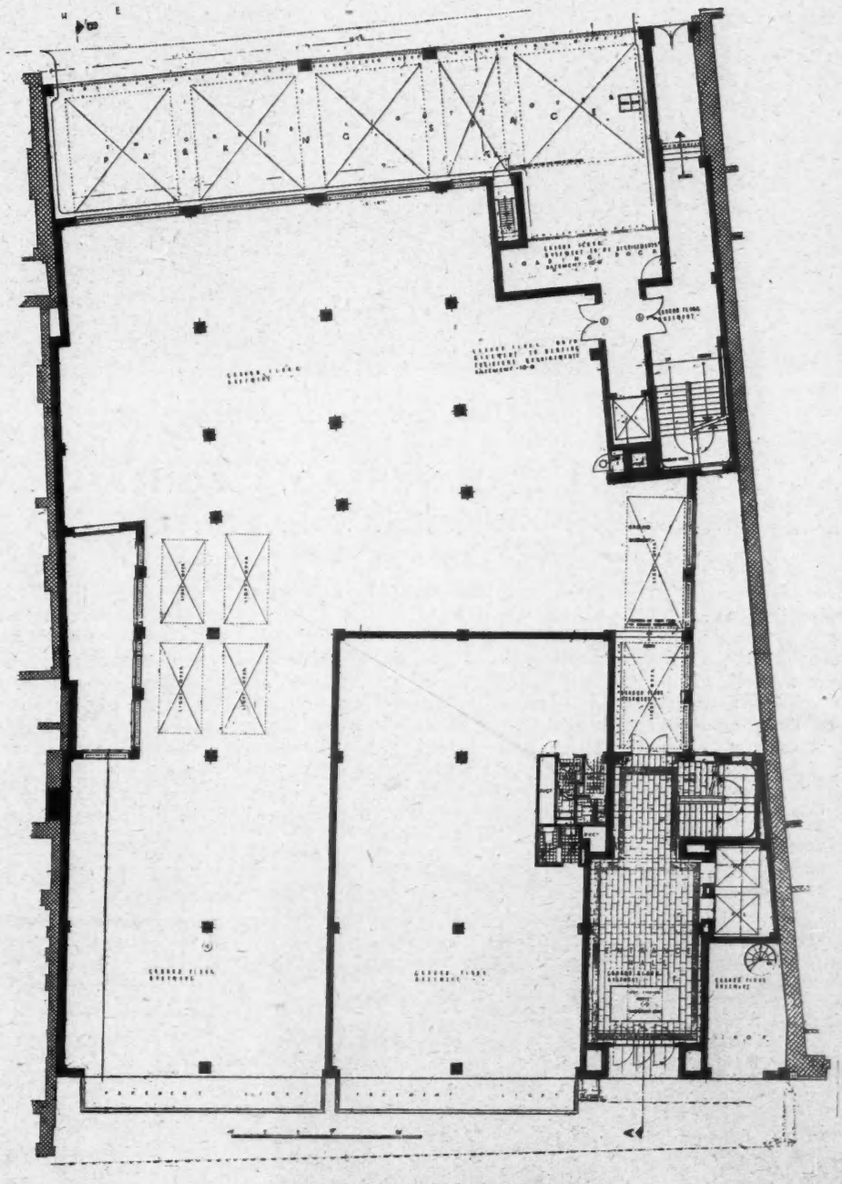
The building consists of basement, ground floor and eight floors over, and is designed for shops on the ground floor, with access on to Whetstone Park at the

rear, and eight floors of office space over. The basement is entirely occupied as an air raid shelter, not only for the use of the building but also for a building adjoining.

Considerable trouble was experienced with protected adjoining rights of light, with the result that "zoning" had to be introduced, both on the flanks and at the rear of the building, so as to overcome this difficulty. There is a covered-in car park at the rear on to Whetstone Park, which is connected with the main entrance hall lifts at the Holborn end of the building. The building contains approximately 80,000 feet super. of actual letting space. The ground floor was designed in such a manner as to allow the reinstatement of a "sitting" tenant, whose business was kept operating during the process of the rebuilding.

The exterior of the building to Holborn is faced with a pleasant grey-coloured brick with reconstructed stone cornice at the seventh floor level, which projects some 3 feet beyond the building face. There are reconstructed stone architraves to the second-floor windows with a moulded stone string course which projects and supports the wrought iron balconies to these windows.

The lower floors of the building are faced in reconstructed stone, including the main entrance archway. The windows throughout are metal casements, and the building is served on all floors by two passenger- and one goods-lift.



GROUND-FLOOR PLAN

OFFICE BUILDING, HIGH HOLBORN. MESSRS. GORDON JEEVES, ARCHITECTS.

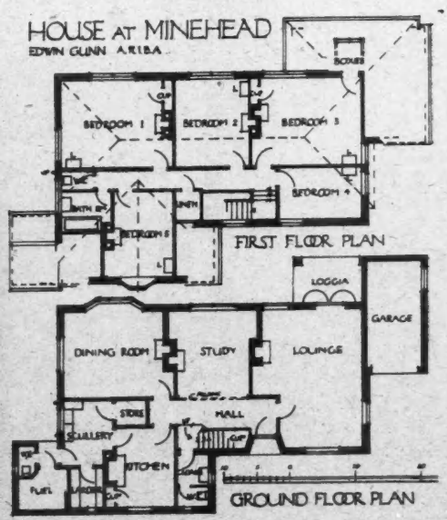
GARDEN FRONT. *Below (left)*: ENTRANCE FRONT.

A HOUSE AT MINEHEAD, SOMERSET.

MR. EDWIN GUNN, A.R.I.B.A., ARCHITECT.

THIS house was planned for a relatively level site fronting north to the road so that all the principal rooms face southwards towards the garden. It was a request of the client that the chief bedrooms should have flat ceilings, and after the work had been started a bay window for the dining-room was asked for, which has been incorporated without appearing an excrescence. The planning presents no abnormal features.

The main portion of the brickwork is built and faced with the local brick, which is a rather dull red having uninteresting texture; quoins, reveals, and bands of dark Bridgwater bricks were therefore introduced, and the south front above ground-floor window heads was tile-hung with dun-coloured sand-faced tiles. Similar tiles were used for roofing, but quickly developed a distinct and darker colour in weathering. The windows are Crittall cottage casements with lead glazing and wood surrounds. The front door and frame are of oak. The builders were Messrs. John Burgess & Sons, of Minehead, who also made all the internal joinery in their own shops.



WAR-TIME BUILDING PRACTICE

By R. Cotterell Butler, A.R.I.B.A.

35.—SYNTHETICS FOR THE BUILDING INDUSTRY

THE WAR AND AFTER

At a time when the attention of the Building Industry is largely devoted to problems arising out of the need for substitutes or alternatives, the whole question of the production of synthetic materials becomes of more than usual interest. In England and elsewhere, much progress has been made in the synthesis of materials to replace or provide alternatives to natural products, not only during this and the last war, but more or less generally over the past thirty years.

In practice, the term *synthetic* is usually taken to include all those materials which may be said to have been produced by a building-up process, the nature of the final product differing somewhat from that of its constituent parts. Literally speaking, metallic alloys, bricks made with straw, and many other materials—most rarely if ever referred to as synthetics—should be included in this category, but for practical purposes the processes involved may be considered as ones modifying the natural material rather than producing an entirely new one.

DEVELOPMENT OF SYNTHETICS

The requirements of war-time building have resulted in a considerably expanded application of the commoner synthetic materials, notably concretes, asbestos cement, and composition board generally, but in the vast group of materials rather unhappily termed "plastics" the extension of their application to war-time building practice has been very limited. The reasons for this (as well as for a much smaller expansion of the use of special concrete mixes and certain types of fibre board than one might have expected in 1939) are as follows:—

The cost of many of the more recently developed products is somewhat higher—even when compared on an efficiency basis—than the materials previously employed. This by no means indicates that the new material is basically more expensive and therefore impracticable. It is due primarily to the fact that until the demand is sufficiently great, the supply possible is unlikely to be enough to induce the most economic output. Moreover, the natural adjustment in price which normally takes place when a new material undergoes development invariably takes time.

Another factor which must be contended with in any programme aiming at the development of a new or fairly recently discovered material, is that of the cost of production-plant and labour. The manufacture of a modern synthetic building material—such as for instance a resin-bound fibre-board—involves special manufacturing plant and suitably trained labour. All this requires time and labour to make and organise, and it may readily be understood why only those industries already under weigh at the outbreak of war seem to have been able to expand to any great extent.

A third factor which may be said to have inhibited the development of many new materials even for war purposes is that of inertia. Unfamiliarity often tends to discourage the use of a new material, particularly where considerable responsibility has to be taken. The attitude may be readily appreciated, but it is unfortunate when opportunities are missed through too much caution or, worse, through a refusal to experiment.

To offset these considerations, there is one factor which, above all others, is likely to contribute to the speedy and economic development of synthetic materials.

There can be few who still doubt the increasing importance of the part which prefabrication (and, parallel with it, mass-production) will play in the building industry after the war, if not during it. Now the efficiency of any prefabrication scheme is dependent upon two factors:

(*a*) A minimised margin of error in the work of the building operative.

(*b*) A maximum economy in the use of materials.

To effect these, the materials used must in themselves be accurate in dimension, economically fabricated, and capable in high degree of being controlled in physical characteristics. These properties are essentially characteristic of synthetic materials, and the development of synthetics will inevitably be a parallel one with that of prefabrication.

MANUFACTURE.

Probably the most important property of synthetics, since they are produced artificially (that is built up, or synthesised) is that their composition is pre-determinable, and similarly their mechanical and physical properties. The summary

GENERAL REFERENCE TO SYNTHESIS OF MATERIALS OF IMPORTANCE IN THE BUILDING INDUSTRY.

FILLER + BINDER + AGENT = PRODUCT.*

FILLER.	Stone aggregates.	Small size stone aggregates.	Cellulose (wood, paper, etc.)	Sand and small aggregates.	Pumice.	Asbestos fibres +	Organic and/or inorganic fibres.	Organic and/or inorganic fibres.	Inorganic fibres.	Cellulose, other organic fibres, inorganic materials.
BINDER.	Portland cement.	Portland cement.	Portland cement.	Portland cement.	Portland cement +	Portland cement +	Portland cement, resinoids, casein, other natural glues.	Cements, glues, etc. (synthetic and natural).	Portland cement, resinoids.	Synthetic resins (resinoids), natural resins, etc.
AGENTS.	Hydration, and dehydration (natural).	Hydration, vibration, dehydration.	Hydration, pressure, dehydration.	Aerating, chemicals.	Hydration, pressure (low).	Hydration, pressure, dehydration.	Low pressure, heat, hydration, dehydration.	Hydration,† heat, pressure (high).	Hydration†, heat, pressure.	Heat and pressure.
PRODUCT.	CONCRETE.	VIBRATED CONCRETE.	LIGHT-WEIGHT CONCRETE.	CELLULAR CONCRETE.	PUMICE CONCRETE.	ASBESTOS CEMENT.	INSULATING BOARDS.	HARD-BOARDS.	FIRE-RESISTING BOARDS.	PLASTICS.
PROPERTIES (special).	High compressive strength.	High density, low porosity.	Low density, high thermal insulation.	Low density, some resistance to effects of moisture, high thermal insulation.		Low porosity, high compressive strength.	High thermal insulation, low resistance to moisture in some cases.	High weather resistance. Some degree of thermal insulation.	Fire and weather resistance.	
APPLICATION (particularly for war-time).	Structural generally, fittings and fitments.	Walling units, fittings, equipment.	Wall and roof construction (suitably water-proofed).	Walls (external if suitably treated), roof structures.		Panels, fittings and fitments. Walls, roofs, equipment.	Suitably treated, used for walls and roofs, internal panelling.	External and internal panelling. Fittings, equipment.	External and internal walling. Roofing. Special fire protection.	See next Article (No. 36).

* Certain plastics, while true synthetics, are not a combination of filler and binder.
† Hydration, of course, applies to Portland cement, and heat to resinoids.

illustrated on page —— is intended to classify the more common synthetic products of use to the constructor and to indicate their general synthesis.

Since they lend themselves to easy control, one may expect to find among the materials included in this group certain characteristics which differ somewhat from natural materials.

In the interest of general economy, any material which may combine structural value, weather-resistance (including insulation) and decorative effect is of the greatest importance to the industry. Naturally it is not possible for all three of these properties to be combined in every instance; in fact, the properties of insulation and structural strength are unfortunately apt to be somewhat opposed to each other. However, from the variety of materials artificially produced which are already at the constructor's disposal, many may be chosen which exhibit all three of these properties to a surprising degree.

In spite of considerable differences in the manufacturing processes employed and the materials used, most synthetic building materials have a common principle of synthesis: they consist essentially of a fibrous or granular material bonded or cemented together by means of what is technically known as a *binder*, the material so bonded being called the *filler*. The bonding process may be carried out by simply mixing the binder with the filler, or as is the case with concrete with the addition of water. Other materials require the application of pressure and/or heat, while vibrated concrete and certain plastics require a more complex process.

Variations in the proportion of filler to binder, and in the type and grain or fibre-size of the filler, the pressure applied and the duration of the bonding process, all result in variations in the characteristics of the material produced. Just as these variations are considerable, so are the properties obtained from one combination of filler and binder.

PORTLAND CEMENT+FILLER COMBINATIONS.

Several applications of Portland cement as a binder deserve special mention, not only as having important possibilities for war-time building purposes, but because their values are considerable at any time and they are likely to undergo vigorous development after the war.

Light aggregate and aerated concretes—formed in the first case by lightweight fillers of cellulose or similar fibres, sometimes with the addition of mineral materials, and, secondly, by an aeration process producing a cellular structure—have a valuable application in emergency building schemes, due to their high insulation/weight ratio, combined with reasonable mechanical strength. Without special treatment they are not usually suitable for outer skins having to withstand the effects of weather, but their other properties more than compensate for this disadvantage.

Vibrated concrete—produced in thin or comparatively thin sections having a high density and resistance to moisture penetration—provides an interesting material for use where these properties are desirable. In particular, highly impervious slabs suitable for outer wall surfaces are capable of being manufactured by site-mass-production methods and are eminently suitable for certain types of emergency structure.

The principles of vibration may furthermore be applied to building components other than wall panels. Any list of general possibilities should include door and window frames, kitchen fittings, shelves, fixed tables and counters.

Another material using Portland cement as a binder and of the greatest importance is asbestos cement. Some considerable time before the war this was already being fabricated in a large variety of ways so that its field of application included such diverse components as rain and soil water drainage fittings and equipment, roof ventilators, internal and external wall panels, and a variety of roof covering elements.

The applications of this material have continued to increase with the progress of the war, and one may expect to find many new developments in the near future. Applications include the development of window and door fittings, and even doors themselves.

Portland cement and certain plasters act also as binders in the manufacture of fibre-composition sheeting of various kinds. The production is somewhat similar to the manufacture of asbestos cement, considerable pressure being employed. Adjustment of pressure controls the density of the material by varying both the specific gravity of the material itself, and also the size of the air cells occurring in the interstices.

Combinations of Portland cement and pumice or breeze also result in interesting lightweight materials which, particularly in the case of pumice, exhibit valuable insulating qualities.

NATURAL RESINS, RESINOIDS, CASEIN AND NATURAL GLUES USED AS BINDERS.

Most insulating boards or hard wallboards are a combination of organic and/or inorganic fibres, bonded together with either a Portland cement binder, as described above, or one of the resins or glues. The hardboards—usually fabricated by the use of considerable pressure—are in many instances both fire- and weather-resisting, and the degree of accuracy obtained in their manufacture makes many of them quite suitable for final surface finishings.

Both the hardboards and the insulating materials possess favourable strength/weight ratios, and the insulating boards are usually extremely shock-resistant.

At the present time (or perhaps it would be more accurate to say immediately prior to the war) most synthetic material was produced in sheet form, but there is every possibility that such pressed or moulded materials will be produced in the form of standard panels, complete with fixing nibs or fillets for use in connection with prefabricated forms of construction.

REINFORCEMENT AND LAMINATION.

The reinforcement of the lighter synthetic building materials follows closely the practice as applied to normal concrete work. Meshes are usually employed, and metal is the most usual type of reinforcement. The principles of pre-stressed steel reinforcement do not seem to be applicable to the lighter compositions, but the use of pre-stressed reinforcement for the economic production of super-efficient dense concrete slabs has already developed commercially, and is likely to continue to do so.

The principles of lamination are more usually applied to plastics than to composition boards, but the high strengths obtained by this means may ultimately encourage experiments along parallel lines. The possibility of laminating weather-resisting skins to insulating bases to give a highly efficient combination is certainly one which should receive every attention.

Plywood is primarily a synthetic product, although it requires natural raw materials in other than an amorphous state. This in war-time is something of a limitation, but when normal import conditions operate, it may well continue to take its place with the development of wholly synthetic products.

Since the first introduction of a "fibre board," steady improvements have taken place in the general quality and particularly the weather-resistance of composition products, and the important part which they are likely to play in the future experiments in large-scale house-production will be primarily due to the basic fact that they are synthetic, and therefore of controllable composition.

PLASTICS

The whole field of plastic technology is one which is both vast and at the same time somewhat unfamiliar to the majority of architects and builders. Furthermore, it is likely to be of such considerable importance to the building industry, if not during the war then immediately afterwards, that it would seem to justify greater consideration than that given to the materials considered above, since they are already familiar in one form or another. In the second part of this article, it is hoped to outline the more important properties of this interesting group of materials, and at the same time to clear up some of the unfortunate misconceptions which appear to be prevalent.

(To be continued.)

A.A.S.T.A.

FOURTEENTH ANNUAL GENERAL MEETING.

This annual general meeting views with resentment Mr. Herbert Morrison's recent statement to the effect that those who advocate deep shelters are a species of fifth columnist, particularly in view of his previous advocacy of 100 *per cent. protection; and urges the immediate construction of bombproof shelters as advocated by the A.A.S.T.A. for the past three years.*

This was the resolution carried unanimously by the A.G.M. of the A.A.S.T.A. on November 9, following an address by Mr. V. L. Nash, A.R.I.B.A., retiring President.

"There is to-day," said Mr. Nash, "a dangerous tendency to 'Utopianism,' particularly in official quarters, which want to encourage thought about planning after the war, while leaving present difficulties of air-raid protection and rehousing of victims unsolved."

The Association had every right, he continued, to be proud that every prophecy it had made about A.R.P. and evacuation for the past three years had been proved only too lamentably true. Single-handed among the country's architectural organisations the Association had striven by every means in its power to deflect the disaster which it could see looming over the people as a result of the Government's attitude.

The A.A.S.T.A. had refused to prostitute its technical honesty by supporting Government policy on A.R.P. The Government did not listen to technical advice. "What prevents proper schemes being carried out?" asked Mr. Nash. The answer lay in the vested interests of the building materials industry, which were afraid to expand plant lest in the future the demand for materials be lessened and prices reduced.

Only the technical ignorance of the public enabled demands for proper protection to be countered by speeches darkly hinting at invasion, the imminent invention of secret weapons, or the efficacy of gas-masks.

Commenting on Miss Wilkinson's aim to make every shelter a club, Mr. Nash said that no amount of welfare organisation could make up for the structural insecurity of the shelters at present provided, which in many cases would not even keep out the rain.

The action of the R.I.B.A. in virtually shutting up shop when the need for a bold lead was most pressing, had thrown on the A.A.S.T.A. an enormous responsibility if the credit of the profession was to be saved. Architects had, by a century of "Utopianism" put themselves in a position where they were regarded as the putters-on of frills. The A.A.S.T.A. stood for the ending of all that. By its tireless technical research, by the close contact of its members with local A.R.P. organisations and tenants' committees, a solid knowledge of what an architect or a surveyor really was was being laid among sections of the people who were formerly only vaguely aware that such men existed.

When the time for reconstruction came it would be to those who had helped them in their hour of need that the people would turn for advice they could trust.

Election of Officers.

The following officers for the coming session were elected at the meeting :—

President : Colin Penn, A.R.I.B.A.

Vice-Presidents : H. L. Barton, A.R.I.B.A., F. N. Brayshaw, F.F.A.S., J. E. Dickson, A. G. Ling, A.R.I.B.A.

Council : Miss J. Blanco-White, A.R.I.B.A., J. Conn, R. E. Cooper, R. I. Greatrex, F. P. Harrison, B. Haward, A.R.I.B.A., H. S. King, R. D. Manning, A.R.I.B.A., P. J. Marshall, A.R.I.B.A., F. J. Maynard, A.R.I.B.A., V. L. Nash, A.R.I.B.A., D. E. Percival, A.R.I.B.A., J. E. Pinckheard, A.R.I.B.A., J. W. Poltock, A.R.I.B.A., C. L. Puckering, T. C. Ralph, R. L. Townsend, A.R.I.B.A., W. L. Vinycomb, A.R.I.B.A., S. H. West, D. H. Wilson, A.R.I.B.A.

SOCIETIES AND INSTITUTIONS

SOUTH WALES INSTITUTE OF ARCHITECTS CENTRAL (CARDIFF) BRANCH AND THE WELSH SCHOOL OF ARCHITECTURE.

Glass in A.R.P. Work.

A lecture, illustrated by films and lantern slides and entitled "Glass in A.R.P. Work," was given to the Central Branch of the South Wales Institute of Architects and the Welsh School of Architecture on Tuesday, October 29, in the Assembly Hall of the Technical College, Cardiff, by Mr. T. M. Rudall, of Messrs. Pilkington Brothers, Ltd. Mr. W. S. Purchon, M.A., F.R.I.B.A., Head of the Welsh School of Architecture, presided over a very large and representative gathering of architects and students of architecture and others interested in the technical aspects of the subject, including members of the Armed Forces, A.R.P. wardens, etc.

The lecturer showed films dealing with incendiary bombs on armoured toughened lenses, the effect of blast on various glasses and types of protective window treatments and the effect of blast on wired glass. He also showed slides illustrating glass in use as an A.R.P. material.

In the ensuing discussion he replied to many questions asked by members of the audience, and at the close a hearty vote of thanks was accorded to him on the proposal of Mr. John W. Bishop, A.R.I.B.A., Chairman of the Central Branch of the South Wales Institute of Architects.

Concrete as Alternative to Timber.

A lecture, illustrated by lantern slides, on "Concrete as an Alternative to Timber Construction" was given at the Technical College, Cathays Park, Cardiff, on Tuesday, November 5, by Mr. Edric Neel, M.A. (Cantab.), A.R.I.B.A., of the Cement and Concrete Association. The lecture was arranged jointly by the Central (Cardiff) Branch of the South Wales Institute of Architects and the Welsh School of Architecture. Mr. W. S. Purchon, M.A., F.R.I.B.A., Head of the Welsh School of Architecture, presided over a representative gathering of architects and students of architecture.

Mr. Neel dealt with the need for the conservation of tensile materials; substitution of reinforced concrete for structural steel; need for standardisation; effect of standardisation on plan and elevation; the qualities of *in situ* concrete and precast concrete; the application of concrete to structure and finish of building work being carried out at present —factories, housing and hutting.

A hearty vote of thanks was accorded to the lecturer on the proposition of Mr. John W. Bishop, A.R.I.B.A., Chairman of the Central Branch of the South Wales Institute of architects, seconded by Mr. G. C. Guilliam, B.Arch., A.R.I.B.A., A.M.T.P.I.

THE INSTITUTION OF CIVIL ENGINEERS.

Presidential Address.

Sir Leopold Savile, K.C.B., in his presidential address to this Institution, on November 5, said that it was perhaps a good thing during times of great stress occasionally to relax and turn our thoughts right away from the present struggle. He had therefore decided to follow the example set by Mr. W. J. E. Binnie, in his presidential address two years ago, and to touch upon ancient history; and since harbour engineering had been the branch of the profession with which he had been principally associated, he proposed to deal with harbours from the dawn of written history to the early days of the Roman Empire.

He reviewed first the development of the four harbours of Alexandria—namely, that of A-ur, about 3000 B.C.; the great harbour of Pharos, soon after 2000 B.C.; the harbour of Alexander the Great, begun in 332 B.C.; and the modern harbour, A.D. 1870.

He then dealt with the pre-Hellenic harbours of Tyre. By 1400 B.C., he said, the renown of the city was widespread, and by 1100 B.C. its seamen had passed Gibraltar and had dared the Atlantic. It was probably about that time the Sidonian harbour was built, whilst Hiram, king of Tyre (970-936 B.C.), built the Egyptian harbour.

In Greece, deep bays and long arms of the sea abounded, forming excellent natural harbours; moreover, Greece was divided into many small States, each with its own port. Great harbours like Pharos and Tyre were therefore unnecessary. Athens used first the broad open bay of Phalerum, where ships were beached in sight of the city. That arrangement, however, had several strategical and navigational disadvantages, and in 493 B.C. Themistocles persuaded the Athenians to develop the fine natural harbour of Piræus. At some places artificial harbours had to be constructed, of which that at Eleusis was typical.

The Romans had to face difficult technical problems when their growing commerce demanded effectual shelter. They introduced many new methods, the most outstanding of which were the use of the arch, the cofferdam, hydraulic cement (pozzuolana), and the driving of piles in deep water. The Roman ideal plan was an artificial harbour having the two incurving breakwaters of the Greeks, with the Roman addition of a short protecting mole or island breakwater in front of the entrance. The sand problem caused considerable trouble, and silting drove the Romans from Antium and the Tiber and caused the failure of the harbour of Ostia. Trajan accordingly took measures to provide a new harbour for Rome higher up the coast, which under its modern name of Civita Vecchia was now the principal port of Rome.

The Roman Empire was followed by more than 1,000 years of quiescence, or even retrograde action, in harbour engineering, and it was not until the engineering revival in about the middle of the eighteenth century that such ambitious schemes were again attempted.

THE INSTITUTION OF STRUCTURAL ENGINEERS.

Members Elected.

The following members were elected on October 24 :—

Graduateship : *N. T. A. Beavan, C. E. Brown, *L. Clements, H. J. Cook, *D. A. Hughes, J. Conner, J. W. Martin, R. C. Moore, N. J. Roostan, W. Taylor, and R. T. Walters.

Associate-Membership : A. L. Arnold, †N. E. Back, †W. H. Bartlett, V. Baxter, F. B. Bott, †R. T. Cook, K. P. D'Aintree, J. K. Dancer, †K. G. Dash, S. Fairey, W. A. Fairhurst, †A. J. Francis, W. G. N. Geddes, F. A. Gerard, R. F. Godman, †J. Gray, J. C. Gray, F. M. Green, †H. G. Hale. A. Harker. J. H. Higgins, †A. G. R. Hill, †E. Hodgson, H. A. Hodson, C.-H. D. C. B. K. Howitz, B. D. Jones, J. C. Kilburn, †J. A. Lecky, P. B. MacFarlane, †N. G. McLean, †A. F. Mason, J. B. Neil, †F. Norman, W. E. Parsons, †W. Pickering, N. C. Sidwell, †F. Simpson, J. W. Stagg, †N. R. Tembe, †C. G. Thirlwall, †H. W. Thrower, †W. A. Tilbrook, †J. G. Veryard, A. V. Waddell, R. C. Westbrook, †F. S. Wilson, and B. N. Wright.

* = Transfer from Studentship.

† = Transfer from Graduateship.

Note.—Each candidate has passed the examination appropriate to his grade of membership.

CONCRETE IN HOUSING

3.—SUSPENDED FLOORS

By EDRIC NEEL, M.A., A.R.I.B.A.

Introduction.

CONCRETE suspended floors have been widely used throughout the country for all types of building, but less for houses than for offices, warehouses and flats. The principal reason why concrete has not been used for the floors and roofs in normal housing types is that under pre-war conditions the cost of concrete construction was greater than that of timber. This cost factor was allowed to outweigh the obvious superiority of concrete in resisting fire and, under war conditions, bombing.

Before considering types of concrete floor construction it is worth while reviewing the conditions which have determined the development of concrete floors. The structures in which concrete was first used were multi-storey factories and warehouses; concrete in flats and maisonettes is a very recent development. Concrete was adopted for factories because of its load-carrying capacity and its resistance to machinery vibration, and for warehouses because of its fireproof qualities combined with its ability to carry heavy loading. In the case of flats and maisonettes, concrete floors were used because concrete combines sound insulation with fire resistance, a secondary reason being the fact that concrete floors are impervious to water, so that liquid spilt on upper floors will not penetrate through to rooms below.

Existing concrete floor types have, by and large, been developed to comply with fairly high standards of loading and fireproofness. However, in domestic work, loading standards are considerably lower. The Ministry of Health Model By-laws specify a superimposed load for domestic floors of 40 lb. per sq. ft., as opposed to 80 lb. per sq. ft. for offices and considerably higher loads for warehouses and similar buildings. Also, it is questionable whether in domestic buildings the same standard of fireproofing as is required in flats and offices is necessary, the more since the whole structure of the house is usually occupied by one family.

In considering existing types of concrete floor construction, it should be borne in mind that they have not been specifically designed for domestic work and therefore both the load-bearing capacity and the fire resistance of the floor may be excessive. Load-bearing capacity and fire resistance bear a direct ratio to the weight of concrete floor construction, and it may be possible, therefore, to develop lighter types of concrete floors for domestic work.

It is an old truism that necessity is the mother of invention, and hitherto there has been no necessity or particular incentive to develop domestic types of concrete floor. However, the war-time demand for housing, combined with the restrictions on the use of timber and steel, is producing modifications of existing floor types. At the moment it is too early to say whether these new types of concrete floor construction will prove successful—time alone with give the answer—but the development in America of the concrete I-joist and slab floor for small houses is an indication that the problem may demand a special solution.

Structural Considerations.

Reference has already been made to the need for strengthening the foundations below 4½-in. loading walls and also to the desirability of extending the lintols over ground and first-floor doors and windows to provide stiffening to the structure and a continuous wall plate which will distribute the load evenly on to the structural walls. Where load-bearing walls are 4½ in. thick only, this wall plate is of particular value.

Another point which arises when using a 4½-in. load-carrying wall is whether such a wall provides sufficient bearing for the floor and roof construction. Where only one span rests on the wall, the full bearing is available; but if the wall has to carry two spans the problem is more difficult, especially where pre-cast units are concerned. In the case of the continuous *in situ* floor it can be assumed that each span obtains the full 4½-in. bearing; but where pre-cast units are used, each unit would have a bearing of only 2¼ in. Furthermore, it is questionable in practice whether even this 2¼-in. bearing would be available, since to obtain this bearing with pre-cast units, which are cast to exact sizes, it would be necessary to set out and plumb load-carrying walls with an accuracy which is almost impossible in practice.

There are, however, many methods of overcoming these difficulties of providing bearing for pre-cast units. In those types of concrete floor which consist of joists and slabs (Pre-cast Type 3) each joist can obtain the full 4½-in bearing, since joists from adjoining spans can be staggered over the bearing wall. In the precast beam types (Pre-cast Types 1, 2, 4, 5 and 6) various schemes have been evolved to ensure good bearing. Hollow beams, for example, are made with the top flange at the ends of the joist cut away, so that the hollow portion of the beam can be filled with *in situ* concrete suitably reinforced. This combination of *in situ* and pre-cast construction solves the bearing problem, serves to tie the ends of adjacent beams together and provides a degree of constructional continuity.

Another point to be watched in connection with 4½-in. load-bearing walls is that first-floor walls should line exactly with those below, in order to avoid eccentricity in loading. In the case of the joist and slab floor the wall can, of course, be built up through the spaces between the joists, so that this difficulty does not arise. A concrete floor which is carried by a 9-in. solid wall or an 11-in. cavity wall should have a bearing of 4½ in.

In Situ Floors.

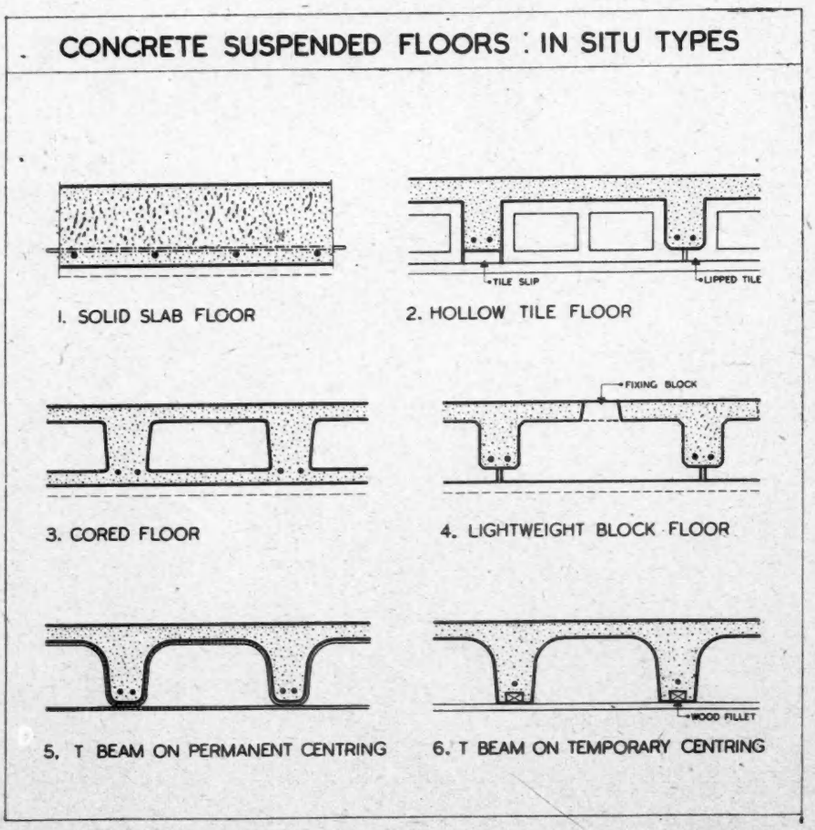
The drawing on this page shows the principal types of *in situ* floors.

(1) The solid slab can be designed as being supported on two opposite sides or on all four sides. In the latter case the concrete is virtually used twice, and slightly less thickness is required. This has the advantage of reducing the cube of the building. Shuttering usually consists of close board framework with the necessary props and runners, but where timber is scarce, such materials as building board and expanded metal or "Hy-rib" can take the place of the close boarding. Where air-raid protection is required, a thickness of at least 4 in. of solid concrete is necessary, and the concrete slab, including finish, should weigh at least 60 lb. per sq. ft.

(2) HOLLOW-TILE FLOOR.—The use of clay or concrete tiles was developed to reduce the weight of the concrete floor by eliminating concrete not required for compressive strength. The hollow-tile floor virtually consists of a series of concrete T-beams, the tiles forming a convenient mould and providing a flush soffit. To assist plastering, the underside of the floor should be of similar texture throughout and to ensure this slips of material identical with that of the hollow tile should be inserted on the underside of the concrete ribs. An alternative method is to use a tile which is pre-fabricated with projecting lips. The use of the hollow-tile floor is recommended by the Building Research Station in their War-time Housing Bulletin, since it uses the minimum of steel.

With the hollow-tile floor, shuttering is simplified, since rough-boarded support only is necessary. Another method of providing support for hollow-tile floors while the concrete is poured is to use telescopic metal centres. These centres have a clear span up to 15 ft. and bear at either end on supporting beams or walls. The centres are placed only under each rib of the hollow-tile floor and require no propping. Even before the concrete is poured the centres and tiles provide a floor on which workmen and material can pass. After the floor is concreted and set the telescopic centres are removed for re-use.

(3) CORED FLOOR.—Another method of reducing the weight of a concrete floor is to



use pneumatic cores to form voids. These cores are deflated and removed after the concrete has been poured. Expanded metal cores can also be used.

(4) LIGHTWEIGHT BLOCK FLOOR.—This type of floor is very similar to the hollow-tile type. The block may be made from any lightweight aggregate, such as pumice, clinker or foamed slag. The small knob on the top of the block is left flush with the top of the structural floor and provides excellent fixing for special floor surfaces. Formwork is similar to that used for hollow-tile floors.

(5) T-BEAM FLOOR WITH PERMANENT CENTERING.—Asbestos or pre-fabricated expanded metal formwork units are used as permanent centering. Very little additional shuttering is necessary, and where asbestos is used a colour-wash ceiling finish only is necessary.

(6) STANDARD METAL FORMWORK.—Standard steel tiles, 2 ft. to 3 ft. long and 21 in. wide, can be hired to act as formwork for an *in situ* T-beam floor. The tiles rest on standard steel channels, which are supported by timber runners propped as necessary. Timber battens are incorporated in the bottom of the ribs to provide fixing for a suspended ceiling. Alternatively, the ceiling could consist of expanded metal, which would be secured by wires placed in the rib during casting.

Pre-cast Floors.

The drawing on the right shows the principal types of pre-cast floor.

(1) HOLLOW BEAM.—A pre-cast version of the cored *in situ* floor. The V-joints between the beams, which are subsequently grouted up, provide space for continuity bars, and by forming an *in situ* connection between the pre-cast beams, enable several beams to act together.

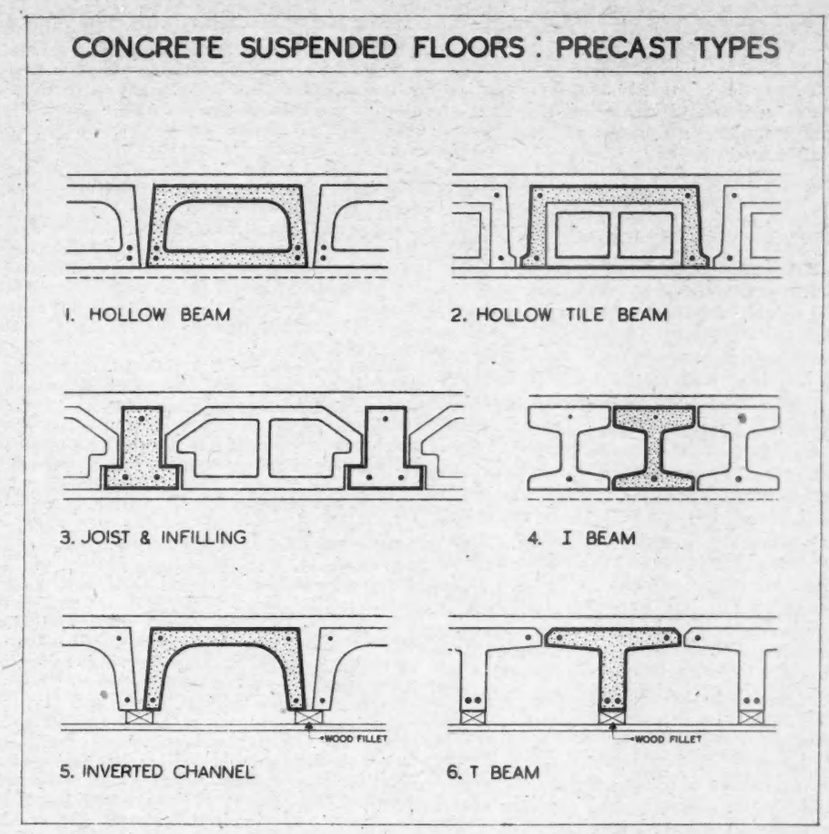
(2) HOLLOW-TILE BEAMS.—A pre-cast version of the *in situ* hollow-tile floor. Additional continuity reinforcement can be inserted in the joints between the beams.

(3) CONCRETE JOIST AND INFILLING.—The pre-cast concrete joist is usually of an inverted T-section, and the infilling may be solid or cored. Suitable materials for the infilling blocks are hollow clay or concrete tiles, solid or cored concrete blocks made with lightweight aggregate. This floor is really a two-operation pre-cast version of the hollow-tile *in situ* floor.

(4) I-SECTION BEAMS.—The comparatively narrow width of the I-section floor beam ensures ease of handling. These beams can be manufactured with interlocking top flanges which form a V-joint for grouting. This interlock prevents rocking and serves to distribute unequal floor loads.

(5) INVERTED CHANNEL SECTION BEAMS AND T-SECTION BEAMS.—These beams are variants on the same theme. In the one case the rib is central on the flange, and in the other the rib is placed at either end of the flange. Both types make an extremely economical use of concrete, but where a flush ceiling is required the ceiling has to be suspended. In both types a combination of hanger and timber batten provides fixing for ceiling boards.

A variant on the T-beam consists of casting what amount to two T-beams in one unit. This eliminates any risk of rocking during erection.



Floor Finishes.

Reference has already been made to the fact that in ground floors a waterproof layer between the site concrete and the ground-floor finish effectively prevents good bond between the finish and the site concrete. Therefore, in order to prevent lifting, the thickness of ground-floor finish should be at least 1½ in., including screed and finish. In upper floors the finish can be well bonded to the concrete so that the thickness of the finish can be reduced.

Floor finishes suited to concrete floors, which have until now had a rather limited market, are now coming into prominence owing to timber restrictions. Many types of floor finish are available, and for purposes of rough classification can be divided under the following heads :—

Hard Surfaces.

SCREED OR GRANO.—1 in. thick. Both screed and grano are applied directly to the structural floor, and colour can be added by using a mineral pigment. The application of wax polish to either of these finishes will give a high gloss surface which facilitates cleaning and prevents dusting. Special paints are also available for application to screed or grano, but before applying a paint the surface of the floor should be thoroughly cleaned and neutralised by brushing on a 15 per cent. solution of zinc sulphate.

A screed or grano finish is undoubtedly the cheapest which can be applied to a concrete floor, but both should be trowel-cut while laying into areas not exceeding 10 sq. ft., joints being subsequently pointed up. The reason for this splitting up of the floor finish is that any building is liable to settlement and movement; such movement will probably crack and craze the floor finish, but if the floor finish is trowel-cut, cracking is less likely to occur, and if it does occur will be limited to the joints where it is least noticeable and can more easily be made good.

TERRAZZO.—⅝ in. thick. Laid on a ⅝ in. cement and sand screed. Terrazzo should be split up into areas not exceeding 10 sq. ft., similar to a screeded finish and for the same reason.

TILES.—⅞ in. thick. Laid on a ⅝-in. cement and sand screed. Concrete or clay tiles should be pointed with a 1 : 1 cement mortar, the underside of the tile being cement grouted immediately before laying.

COMPOSITION FLOOR.—¾ in. thick. Provided a concrete floor is ruled level, a composition floor can be laid direct without any screed. The comparative roughness of the ruled-off concrete floor as compared with the smooth screed finish ensures a good bond. Composition floors have often proved unsatisfactory in the past, but now that a Code of Practice for the laying of these types of floor has been published by the Building Industries National Council, they have greatly improved.

Magnesite is not, of course, the only binding agent used in composition floors. Rubber latex and bitumen base composition floors have also proved successful. Non-magnesite composition blocks, some ⅝ in. thick, can be laid direct on screeded concrete floors, and in appearance the blocks are similar to polished wood blocks and can be laid to any wood-block pattern.

Wood Surfaces.

WOOD BLOCKS.—⅞ in. thick. Both hard and soft wood blocks with interlocking joints can be fixed directly to the concrete with a mastic. It is essential that the concrete be allowed to dry out thoroughly and treated with creosote oil before wood blocks are laid.

Soft Surfaces.

CARPET.—¼ to ½ in. Carpet laid direct on concrete should have a thick underfelt. In order to facilitate fixing, wood plugs at 18-in. centres round the edges of the room should be left in the concrete as it is poured. Wood carpet strips can then be nailed to the plugs and the carpet tacked to the strips. Alternatively, holes may be drilled into the finished concrete and wood-plugged to provide fixing for carpet strip.

LINO.—⅛ in. to ¼ in. Plain, inlaid or embossed linoleum is laid with a waterproof mastic direct on to the concrete floor.

RUBBER.—⅛ in. to ⅜ in. thick. Available in sheet or tile form with or without a sponge-rubber backing. Fixed by a mastic to level screeded floor.

CORK.—¼ in. to $\frac{5}{16}$ in. thick. Usually supplied in tile form and fixed with a mastic.

(*To be continued.*)

Works Safety in War Time.

The National Safety First Association has produced (on behalf of the Ministry of Labour and National Service) a pamphlet in which is described a scheme for preventing accidents in factories. The scheme, which has the blessing of Mr. Ernest Bevin, is one in which display posters and pamphlets for distribution to workers largely figure. The pamphlet contains also an outline of works safety organisation and a statement on first-aid. Details are available from 52, Grosvenor-gardens, S.W.

THE PURCHASE TAX.—II

By W. T. CRESWELL, K.C.

It has been stated broadly, on the authority of the Chairman of the Central Price Regulation Committee, that since retail stocks in the country of many articles scheduled under the Purchase Tax are understood to be substantial, the public should continue to be able to purchase these goods at the untaxed price "for a considerable time to come." This is clear in respect to scheduled articles with which other trades are concerned, but it is not at all clear that it applies to scheduled articles used especially in the building and engineering industries.

In our last issue we stated we had official information regarding the effect of the purchase tax on taxable ironmongery and other goods, to be provided from existing stocks by a retail merchant not himself the manufacturer of them. This information gave us to understand that such goods were *ordered* from him before the date on which the tax came into operation but were required *not to be delivered* till the contractor for the works should be ready to use them; that being when the tax was actually operating (that is, from October 21 last), then the goods would be subject to the addition of Purchase Tax. But it now appears that this information is not in accordance with the utterances of the chairman as understood by the majority of his audience on the occasion referred to above.

Again, the Act itself clearly states that the tax is not chargeable on goods in stock. It is also illegal for the seller to levy the tax on any goods on which he himself will not be called upon to pay the tax, as it was stated that no trader was to make personal profit by the tax.

In this regard we referred last week to an actual instance where goods ordered before October 21 were to be delivered only when convenient to the purchaser. It is now our view that these goods on delivery were free of tax, as the merchant was under a contract entered into before that date.

It is therefore easy to understand that any satisfactory interpretation of the Act and the official notices regarding it is extremely difficult.

Another complaint made is that any purchaser who suspects a merchant or retailer of overcharging may lay a complaint before the local committee set up by the Government, but he has no right to make any preliminary inquiries from the retailer which might dispel his suspicion.

Further, it seems that the proportion of the tax which the merchant or retailer can pass on to the purchaser is to be decided by the merchant or retailer, who is supposed to make such a decision after considering the deal which he himself made with the manufacturer.

The Distributors of Builders' Supplies Joint Council issued on November 1 an extremely useful document containing replies to representations made by them to the Customs and other Government Departments, together with replies to various queries that have been raised as regards the application of the tax. It also deals, amongst other things, with the effect of enemy action on contract jobs. We commend the document to the careful study of our readers.

SOME FRESH DECISIONS ON THE TAX.

The following decisions of H.M. Customs and Excise regarding liability to Purchase Tax are published as supplementary to those already given in Notice No. 78 :—

Class 2 (Textiles, etc.).—Not chargeable—Roofing "felt"; woodwool.

Class 4 (Pottery, etc.).—Not chargeable—Monumental masonry, tombstones, vases designed for use on graves.

Class 6 (Furniture).—Not chargeable—Telephones and switchboards; two-tier and three-tier bunks if constructed in sections for assembly in long lengths in shelters or if of other design unsuitable for use as domestic furniture; canvas-buckets, washstands and baths of canvas.

Class 7 (Lighting Fittings and Domestic Appliances, etc.).—Not chargeable—Domestic cooking and heating appliances for solid fuel: Kitchen ranges and cookers constructed as single units over 66 in. in width; portable boilers over 15 gallons capacity; heating stoves of a heating capacity of over 10,000 c. ft.

Class 9 (Hardware, Turnery, etc.).—Chargeable at the rate of 33⅓ per cent.—Non-consumable firelighters; leak stops and pot menders; soap dispensers; drugget pins; draught excluders; plywood chair seats; pot scourers, including steel wool in packets; fireguards; wire meat safes; wire vegetable baskets and racks; egg-preserving baskets; pulpware pails, bowls, etc.; "savings banks," other than of iron and steel holloware; boot-scrapers, except of the "built-in" type; button hooks; domestic coal, coke, cinder and copper fire shovels; rubber hot-water bottles; flower baskets; table bells; gas tubing in short lengths; rubber gas-tubing connections; whistles and whistle chains; key rings and key chains; trivets; false bottoms, checks and coal savers; mantle rods; goffering irons.

Chargeable at the rate of 16⅔ per cent. (Holloware of iron or steel)—"Savings banks" of iron and steel holloware; sanitary closets.

Not chargeable—Machinery belting fasteners; stirrup pumps; "Anderson" shelters; wire rat traps (garden, farm and warehouse types); pulleys; fire extinguishers; Rawlplugs and Rawlplug sets; bedstead knobs; cupboard knobs; kettle and teapot knobs; buckets (contractors', industrial and dairy) weighing over 45 lb. per dozen; oil containers, oil measures and oil cans; "built-in" type bootscrapers; grave vases; cleat hooks; tassel hooks; rack pulleys; butchers' trays; specialised funnels (*e.g.*, grocers', garage, etc.); ice-cream serving utensils; choppers, axes and hatchets; glues.

Class 10 (Trunks, Bags, etc.).—Not chargeable—Paper carrier bags.

EMERGENCY INQUIRY BUREAU

Questions from readers arising out of War-time difficulties and recent Emergency legislation will be answered by a special staff of contributors. Questions, which should be addressed to the Editor, should be accompanied by a stamped addressed envelope.

Pricing of Schedules of War Damage.

Sir,—*What is the position to-day when contractors are wanted to prepare and price a schedule of the damage done by enemy action? Does this still come under the item "Estimates Free," or is there a possibility of being paid for such services?*

Property owners are compelled to obtain the priced schedule to substantiate the claims made, but there is little evidence the repairs will be done until after the conclusion of hostilities. Tendering under normal conditions is an expense, but with the volume of inquiries now, the cost to the contractor is enormous. To suggest to owners a qualified surveyor be approached meets with scant approval, it being understood immediately that the surveyor requires a fee. E. P. J.

There is no official ruling upon the matter raised by our correspondent. The London Master Builders' Association inform us that in their opinion the pricing of schedules of damage is a matter for the quantity surveyor. While no doubt this is strictly accurate, in many cases a builder may be asked by architects of his acquaintance to price a schedule of damage. The National Federation has taken no decision about the matter, but it would seem reasonable that where the architect is known to the builder, or where the latter considers that work may eventually materialise, it may be to the builder's advantage to price a schedule free, but where these considerations do not apply, it would seem only fair that a small fee be charged, based as a percentage on the value of the estimate.

Purchase Tax and Builders' Merchants.

Sir,—*Are builders' merchants registrable under the Purchase Tax?* Surrey.

No. The Distributors of Builders' Supplies Joint Council have been specifically informed on this point by the Commissioner of Customs and Excise.

IN PARLIAMENT

Repair of Damaged Houses.

Sir Jocelyn Lucas asked the Home Secretary whether he would authorise occupiers or landlords of bombed dwellings to spend some small sum, say, £5 or £10, on urgent repairs, such as blocking broken windows or covering roofs, pending sanction of proper repairs by the local authorities, since, if the weather be adverse, far greater damage might be caused by the inevitable delay in obtaining permission to proceed with repairs.

Mr. MacDonald said he was afraid that the arrangement suggested in the question would only lead to greater competition for the services of local builders, and would therefore be likely to lead to a net delay in the work being done. Under the Housing (Emergency Powers) Act, 1939, local authorities were empowered to finance repairs which they were satisfied were necessary and which had been carried out under arrangements made by them or with their prior approval. In such cases the cost formed a charge on the property, but no payment was required from the owner until after the war. Unless, therefore, an owner was prepared to meet the cost of repairs himself, he should consult the local authority before taking action. Such consultation should not involve any appreciable or avoidable delay.

Mr. Thorne asked whether, in view of the fact that there were thousands of damaged windows, especially in the East End of London, advice could be given as to the best way of obtaining glass to replace them.

Mr. MacDonald said it was not policy to replace the glass in the windows under present conditions. Substitutes were being used which were much more effective for short-term purposes and equally, or nearly equally, effective in keeping out wind and rain.

Replying to further questions, Mr. MacDonald said that the importance of roofing was fully appreciated by the Government, but the real trouble in London was the shortage of skilled labour. Every possible step was being taken to increase the supply of skilled labour. Where owners were prepared to provide the labour themselves the work could be done and arrangements could be made for reimbursement by the local authorities.

The Joint Committee.

Sir Jonah Walker-Smith asked the Minister of Labour whether his policy and intentions had changed since 14 weeks ago he appointed a small joint committee of employers and operatives in the building and civil engineering industries for the purpose of advising him upon any matters concerning these industries; whether he was aware that, although the committee had held itself in readiness to meet at very short notice and very frequently, it had been called into consultation only upon two occasions for com-

paratively trifling purposes although many matters vitally concerning these industries had arisen in the interim; if he had considered a letter of protest sent to him two weeks ago in regard to this from the operatives and employers concerned and if he was willing to discharge the committee in order that the national organisations of operatives and employers might be left independently to look after the interests of the operatives concerned.

MR. E. BEVIN said that it remained his intention to consult the committee. He regretted that in the pressure of events the committee had not been called together more frequently, though he would not agree that the subjects discussed were comparatively trifling. Another meeting was proposed for an early date. It would be his aim to maintain close contact with the representatives of employers and operatives in these industries. In this connection he was considering the observations made in the letter to which his hon. friend referred in the last part of his question, which he regretted not having answered earlier. He was also consulting with the Minister of Works and Buildings in view of the new functions for which he would now be responsible.

Damp in Shelters.

MR. BEECHMAN asked the Home Secretary whether he was aware that brick and concrete communal shelters in London which had been built without dampcourses were now being fitted with bunks, with the result that lower berths will be extremely damp; and whether he would give an assurance that new shelters designed for sleeping purposes would have damp-courses, and that such steps would be taken as might be possible to remedy the defect in existing shelters.

MR. MORRISON said that it was doubtful how far the provision of a dampcourse would effectively check damp in new structures, but it was, in fact, intended to incorporate such a feature in the new design which was, for other reasons, about to be introduced in supersession of existing designs.

Lodging Conditions for Workers.

SIR JONAH WALKER-SMITH asked the Minister of Labour whether he was aware that the conditions in respect of lodging, living and travelling arrangements of large numbers of men belonging to the building and civil engineering constructional industries sent by his Department to work at various outlying places upon Government works of great urgency and importance were often unsatisfactory and, in many cases, deplorable; and if, as such conditions had been well known for many weeks, he would deal with the matter promptly and sympathetically under the very ample powers with which he had been vested.

MR. E. BEVIN said that the difficulties to which his hon. friend referred were largely due to inadequate attention being paid by the contractors in planning their organisation to the need for adequate lodging, living and travelling arrangements for the workpeople. His Department, together with the Departments responsible for the general arrangements for billeting, feeding and transport, gave every assistance in their power, and he was in communication with representatives of the building and civil engineering industries as to further steps which he considered should be taken. He hoped to have the assistance of the Minister for Works and Buildings in this matter.

Salvaged Materials.

MR. MABANE, on behalf of the Minister of Works and Buildings, said that arrangements had already been made in London for the removal, sorting and storage for reuse of salvaged materials (including bricks), and local authorities in the provinces had been authorised to take similar action. Material so recovered was already being used by local authorities for the erection of air-raid shelters, and arrangements were under consideration for the utmost possible utilisation of all salvaged materials.

A.R.P. SCHEMES

LONDON.

DAGENHAM.—T.C. approved number of domestic shelters in lieu of Anderson shelters.—First-aid post being erected in Chadwell Heath, at £2,923.—Contract placed with Allen Fairhead and Sons, at £5,397, for A.R.P. depots.—Plans passed for four shelters, for May and Baker, Ltd.—Maycrete Sales, Ltd., to concrete seating for raid shelters, at £187 10s.

DEPTFORD.—B.C. placed contracts for shelters with H. T. Else, Greenaway and Son, and Arbro, Ltd.

ERITH.—T.C. placed contract with Wm. F. Blay, Ltd., for domestic shelters.

HAMMERSMITH.—B.C. approved Sika-Francois, Ltd., 39, Victoria-st., S.W.1, for waterproofing Anderson shelters, at £6,000.—Council recommend application to M.H. for sanction to borrowing £22,212 in connection with A.R.P. expenditure.

KENSINGTON.—B.C. accepted tenders of General Asphalte Co., Ltd., and Everseal Products, Ltd., for waterproofing the roofs of domestic surface shelters.

POPLAR.—B.C. to make all shelters gas-proof.—Contracts for 33 additional public shelters placed as follows: London Co-operative Society, C. P. Roberts, Callow and Wright, W. S. Sharpin, H. Mills and Sons, and G. J. Anderson.—Premises at a wharf to be adapted as a shelter for 400 persons, at £500.—Sandbag shelters at three depots to be replaced by brick shelters at £255.—Shelters as refuges for children separated from parents being provided, at £400.—B.E. and S. to adapt portion of a railway arch as public shelter for 249 persons, at £330.—Public shelter to accommodate 150 to be provided adjoining a hall, at £624.

ST. PANCRAS.—B.C. approved scheme, by Chief Electrical E., for internal lighting to surface communal shelters, at £2,529.—Council approved extension to basement shelter at a coaching station to accommodate a further 1,000 people, at £2,267.

SOUTHALL.—B.S. to provide for protection of staff, shelter accommodation at branch library.—Approval of Home Office received to expenditure of £329 for auxiliary fire station. Tender of E. Plaistowe and Son, Ltd., accepted for work.—C.C. approved scheme, estimated to cost £38,300, for shelter protection of approximately 19,500 persons in borough eligible for free shelter.—Quotations of Grainger and Apthorpe, Percy Bilton, Ltd., and Balls and Partners, to carry out necessary work in erecting 50 shelters, accepted. List of tenders on page 496.

TWICKENHAM.—For supply of bunks, T.C. accepted the following: Three hundred 3-tier for public shelters, Hampton Timber Co., Ltd., £3 1s. a set; 1,000 3-tier for public shelters, James Walker, Ltd., £2 5s. a set; and 750 7-person sets for communal shelters, James Walker, Ltd., £4 19s. 9d. a set.—B.S. submitted proposals to C.C. for shelters for 1,300 persons.

WALTHAMSTOW.—T.C. to erect shelter to accommodate 50 persons.—Plans passed for shelter, for Baird and Tatlock.—Council to spend £958 on decontamination laundry, and £4,379 on camouflaging buildings.—Tender of Sands and Lipscomb, Ltd., amounting to £310 5s., accepted for 14 surface domestic shelters.—Basement shelter for 250 persons, at £250, approved.—Shelter to be provided at a school.—B.E. and S. to carry out flooring work in shelters.

WIMBLEDON.—M.H. approved replacement with brickwork of sandbag revetments at first-aid posts, at £1,000.—Emergency Committee of T.C. recommended to give immediate consideration to practicability of providing deep shelters in borough.

PROVINCIAL.

ADWICK-LE-STREET. — U.D.C. placed contracts for dual shelters of communal type, each to accommodate 24 persons, on selected sites. Plans by W. S. Ellis, S.

AMLWCH.—U.D.C. to erect domestic shelters.

ASHTON-UNDER-LYNE.—T.C. to erect public shelter adjoining chapel at the cemetery.

BARNARD CASTLE.—R.D.C. had plans approved for six shelters, and preparing plans for shelters at 13 other places. T. V. Lang, S.—U.D.C. to build ten public shelters. F. L. White, S.

BARNSLEY. — T.C. propose "deep" shelters. Plans by H. Taylor by B.E.

BATH.—City E. and City Electrical E. to prepare detailed estimates for submission to Regional Technical Adviser on shelter lighting proposals.

BEAUMARIS.—T.C. to erect public and domestic communal shelters.

BLABY.—R.D.C. to erect public and domestic shelters. Plans by F. W. James, S., Atlas-chams., Berridge-st., Leicester.

BOLDON.—U.D.C. accepted following tenders for concreting and waterproofing domestic shelters, J. B. Wilson, Boldon Colliery, 83; E. Clarkson, Ltd., East Boldon, 83; Gordon Durham, Ltd., East Boldon, 83; G. Henderson, East Boidon, R. Brown and Sons, South Shields, 85; W. D. Allison, Whitburn, near Sunderland, 85.

BORDER.—R.D.C. to erect communal and domestic shelters. Plans by E. Gray, E., 7, Victoria-pl., Carlisle.

BRIGHOUSE.—T.C. to erect public shelter at recreation ground.—T.C. approved: shelter, Lightcliffe, Hipperholme, A. Chapman.—Gibson Bros., builders, Lillands-av., secured contract for about 100 shelters for T.C.

BURNLEY.—A.R.P. Committee propose raising floors in 300 Anderson steel shelters, at £375.

CHESTERFIELD.—T.C. to consider construction of "deep" shelters.—Additional public shelter for 200 persons proposed. Plans by W. S. Wilson, B.S.

CONISBOROUGH.—U.D.C. to erect surface domestic communal shelters. Plans by H. Thirlwall, S.

CROFTON.—E.C. propose shelter at elementary school, at £540. Plans by H. Wormald, County Education Architect, Wakefield.

CUMBERLAND.—C.C. to build public shelters at Cockermouth, Keswick and Penrith, at £6,400. County Architect, J. H. Haughan, 4, Alfred-st. North, Carlisle.

DESBOROUGH.—U.D.C. to erect six public shelters. Plans by A. Harris, S.

DEWSBURY.—T.C. to erect 24 additional shelters of domestic communal type for 642 persons, at £1,200. M. H. Forward (A.), Borough Architect.

FELLING-ON-TYNE.—U.D.C. to build further public shelters.—Ministry of Home Security approved 15 further shelters.

FULWOOD.—U.D.C. to erect domestic communal shelters, with provision for bunks, lighting and heating. Plans by W. S. Watkinson, S.

GARSTANG.—R.D.C. to erect public shelter for 50 persons.

GILLINGHAM.—T.C. received tenders from Kemp Bros., and E. Wraight, Ltd., of Sittingbourne, for domestic and communal shelters.—Shelter accommodation to be provided at a council library.

GRIMSBY.—R.D.C. received approval for waterproofing with concrete 174 small, 15 standard, and six extension "A" Anderson steel shelters.

HEMEL HEMPSTEAD.—Tender of Provis Thorne, Ltd., amounting to £1,625 2s., for shelter protection at nine schools in borough accepted.—E.C. decided to obtain tenders for shelters at two other schools.

HINDLEY.—W. J. Bickerstaff and Son, Wigan; J. W. Liptrot, Orrell; Heaton and Dennis, Wigan; J. R. Whiteside, Hindley, to divide between them contract for 80 com-

munal shelters, for U.D.C. Plans by O. P. Abbott, S.

KETTERING.—T.C. propose waterproofing by cement lining Anderson steel shelters in a number of roads.—T.C. approved: shelter, Durban-rd., K. Barlow.—R.D.C. to erect domestic communal shelters. Plans by S. Wallis, S.

KIDDERMINSTER.—T.C. to erect 18 additional domestic communal shelters. Plans by J. Hawcroft, B.S.

LANCHESTER.—R.D.C. to build communal shelters, at £7,000, to accommodate inhabitants of 597 houses.

LEEDS.—T.C. to adapt basements and cellars for public shelters.—Basement of building in erection to be converted for public shelter. Plans by W. S. Cameron, City E.

LLANDUDNO.—U.D.C. to erect two 48-person public shelters. Plans by T. W. Ward, S.

LLEYN.—R.D.C. propose domestic communal shelters in six districts.

LYMM.—U.D.C. to erect public shelter for 50 persons and 22 additional domestic communal shelters. Plans by D. Mort, S.

MANCHESTER.—E. A. Newton (L.), architect, Rutherford-chams., Bow-la., has prepared plans for underground four-tier brick and concrete shelter. Accommodation for 200 estimated at £3,000.—T.C. approved: First-aid and decontamination centre, for I.C.I., Ltd., Blackley.

MENAI BRIDGE. — U.D.C. to erect domestic shelters.

MEXBOROUGH.—Board of Management of Montagu Hospital propose shelters.

MIDDLETON.—T.C. propose waterproofing Anderson steel shelters by direct labour.

MORLEY.—T.C. propose laying concrete foundations to Anderson steel shelters for prevention of flooding.

NORTHAMPTONSHIRE. — E.C. propose replacement of sandbags at schools with brickwork in cement mortar, at £4,000. Plans by G. H. Lewin, County Architect, Northampton.

NORTHUMBERLAND.—C.C. to spend another £5,653 on school shelters.—Sanction received to borrow £8,000 for shelters.

PRESTON.—Board of Management of infirmary propose A.R.P. work, at £1,000. Plans by A. C. M. Lillie (L.), architect, Dowry House, Brownedge, Bamber Bridge. —T.C. propose public shelters for 900 persons, at £2,590. Public shelters at maternity and child welfare centres proposed. Plans by J. E. Foster, B.S.

SHEFFIELD.—T.C. to erect brick walls and protective works at institutions.—Estates Committee to erect shelters at all Corporation houses, irrespective of income, on housing estates.—T.C. to adapt all existing shelters to conform to bomb-proof type known as "Haldane two-stage shelter."

SPILSBY.—R.D.C. to erect four 25-person public shelters. Plans by W. Bailey, S.

STAFFORDSHIRE.—E.C. propose shelters to schools at Betley, Coven and Tean. Plans by G. C. Lowbridge, County Education Architect, Stafford.

STOCKTON.—T.C. approved scheme to improve shelters by lighting, heating and sanitary installations, and to continue building shelters. A. S. Knelles, B.E.—R.D.C. to proceed with a further programme of shelters. Plans by G. W. T. Brown, S.

SUNDERLAND.—Shelter accommodation to be provided by direct labour dept., at ££350, at hospital, for T.C.

TICKHILL.—U.D.C. propose six communal public shelters. Plans by J. Haslam, S., Newcastle-chams., Ryton-st., Worksop.

TUTBURY.—R.D.C. propose domestic shelters. Plans by A. S. Broad, S., The Poplars, Rolleston-rd., Burton-on-Trent.

WALLSEND.—T.C. to build shelters for residents of Portugal-pl.

WARWICKSHIRE.—E.C. propose shelters for juniors and infants at Coventry, Rugby, Solihull, etc.—E.C. has received £70,000 grant for shelters for schools. Plans by A. C. Bunch (F.), County Architect, Warwick.

WEST AUCKLAND. — E. M. Lawson, Barras-bldgs., Barras Bridge, Newcastle, architect for shelter at factory.

SCOTLAND.

GLASGOW.—Corporation Emergency Committee agreed to make another experiment with small tunnel shelter.

CURRENT AND PROPOSED BUILDING WORK*

Ashton-in-Makerfield.—U.D.C. propose improvement of sewerage works.

Ashton-under-Lyne.—T.C. propose conversion of boiler house at Town Hall into police mess-room, etc.

Bakewell. — Justices approved plans: Structural alterations at "Pack Horse" Inn, Crowdicote. Cap. A. S. Tibb.

Bangor.—Court of Governors of the University College of North Wales propose completion of new Hall of Residence for Male Students in course of erection in University grounds. Plans by Mr. P. E. Thomas (F.), architect, 10, Cathedral-rd., Cardiff.

Barnard Castle.—Plans approved for alterations to "King's Head" hotel, for T. M. Addison.

Cheltenham. — T.C. approved: Stroud Brewery Co., Ltd., alteration, "Bakers Arms," High-st.

Consett.—U.D.C. to convert premises into mortuary. Plans by T. P. Leath, S.

Coventry. — E.C. to erect elementary school. Plans by D. E. E. Gibson, City Architect, 1a, Warwick-row.

Criccieth.—U.D.C. propose mortuary at cemetery, and reconditioning houses. Plans by G. H. Williams, S.

Cumberland.—C.C. to carry out repairs to sea wall at Silloth, at £250.

Durham.—C.C. to carry out renovations at sanatorium, at £1,500; renovations at another sanatorium, at £690.—Health Committee included in estimates £200 for alterations to heating of new pavilion, £500 for central heating of maids' quarters at a sanatorium, £300 for outside storehouse at sanatorium, and £600 for new premises for maternity and child welfare centre.

Durham.—It is proposed to convert Stanhope Castle, Stanhope, into approved school. Plans by W. J. Merrett, C.S., Durham.—County P.A.C. to obtain tenders for stores at Chester-le-Street Institution, at £230. Plans by C.S.

Hollingworth.—H. Lass and Co., Ltd., Commercial-st., London, E.1, propose new works.

Keighley.—T.C. approved: Canteen and rest room for J. P. Heaton and Co.

Kettering.—T.C. approved plans: Extensions to works, for E. C. Gravestock, Ltd.

Leyton.—T.C. approved plans for Grano-Metallic Paving and Plastering Co., Ltd., for temporary office and store shed.

Manchester.—Housing Committee received sanction to borrow £68,485 for working-class houses.—Markets Committee propose extensions of storage room at Cold Stores.—T.C. approved Y.M.C.A. building for Lancashire Divisional Council, 83, Bridge-st., Deansgate.

Preston.—T.C. approved: J. Cartmell and Sons, Ltd., strong room, Brook-st. Mill; Electricity Dept., sub-station; G. G. Baines, for L. Titterington, five houses.

Rawtenstall.—T.C. approved: Alterations, for Glendale Yarns, Ltd.

Rochester.—Corporation to adapt premises as police station instead of building new station. Cost, £600.

Rotherham.—E.C. received sanction to borrow £7,500 for junior school and £1,000 in respect to open-air school for physically defective children.

Stockport.—Justices approved plans: Structural alterations, "Park" Hotel, Newbridge-la. Plans by Architects' Dept., Manchester Brewery Co., Ltd., Woodside Brewery, Eccles New-rd., Salford, 5.

Stratford-on-Avon. — R.D.C. approved: electricity sub-station, Warwick and Leamington-Spa Electric Supply Co.

Wallsend.—Plans approved for canteen and lavatories, for Cookson's Lead and Antimony Works, Willington Quay.

Walthamstow.—T.C. approved plans for temporary social hall, for Baird and Tatlock.

Whitehaven.—Cumberland Motor Services, Ltd., Tangiers-str., propose buildings on site of Grand Hotel. Plans by J. S. Stout, architect, 36, Lowther-st.

Warwickshire.—Standing Joint Committee propose additions at Kenilworth police station.

Wembley.—T.C. approved scheme by B.E. and S. for surface water sewer to relieve flooding, at £6,000.—B.E. to construct footbridge and carry out road works at Manor Farm-rd., at £505.

West Ham.—C.B. approved: Extension to offices, J. Russell and Co.'s premises, Butchers-rd.

Wolverhampton.—T.C. approved: Ford and Weston, extension to factory; Manley and Regulus, extension to factory; Cleland and Hayward, extension to factory.

Wrexham. — Home Office, Whitehall, S.W.1, acquired property for conversion into approved school.

* See also List of Contracts Open.

***** In these lists every care is taken to ensure that information given is accurate and up to date, but it may occasionally happen that, owing to building owners taking the responsibility of commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced.**

BUILDING ILLUSTRATED

STRETFORD NEW TECHNICAL COLLEGE.

For this building (designed by Mr. Stephen Wilkinson, A.F.C., F.R.I.B.A., Lancs County Architect), the general contractors were Messrs. J. Cocker, Ltd., Walkden, near Manchester. Sub-contractors were: Mason, the Bolton Stone Co., Ltd.; slater and tiler, W. Altham; plumber and glazier, J. Jaffrey and Co.; plasterer, W. Pickup; painter, A. Sharrocks; heating and hot water services, C. Seward and Co., Ltd.; electric lighting, R. N. Tinniswood; concrete floors, Bolton and Hayes, Ltd.; roof glazing, Monks Patent Glazing Co.; faience wall finish, Shaws Glazed Brick Co., Ltd.; terrazzo, Stefanutti Terrazzo, Ltd.; composition block floors, the Granwood Flooring Co., Ltd.; cork terrazzo floors, Cork Insulation, Ltd.; wall tiling, A. Francis; wood panelling, W. Higgin, Ltd.; iron balconies, grilles, etc., Hills Patent Glazing Co., Ltd.; railings and gates, bronzework, Brookes and Co. (1925), Ltd.; stone carving, J. Lenegan; two cross-overs, Betheil and Sons, Ltd.; sanitary fittings, Musgraves, Ltd.; steelwork and roof principals, E. Wood and Co., Ltd.; steel windows, Humphries, Jackson and Ambler, Ltd.; reconstructed stone, the Christie Patent Stone Co., Ltd.; grates and mantels, Newton, Chambers and Co., Ltd.; ironmongery, W. and R. Leggott, Ltd.; dome lights, Lenscrete, Ltd.; doors and screens, Venesta, Ltd.

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender, that a fair wages clause shall be observed, that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender, unless stated to the contrary. The dates at the head of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained. Abbreviations: (A.) for A.R.I.B.A.; B. of E. for Board of Education; B.C. for Borough Council; B.E. for Borough Engineer; B.S. for Borough Surveyor; C. for Clerk; C.B. for County Borough; C.C. for County Council; C.E. for County Engineer; C.S. for County Surveyor; D.S. for District Surveyor; E. for Engineer; E.C. for Education Committee; (F.) for F.R.I.B.A.; (L.) for L.R.I.B.A.; M.W.B. for Metropolitan Water Board; M.H. for Ministry of Health; M.T. for Ministry of Transport; P.C. for Parish Council; R.D.C. for Rural District Council; S. for Surveyor T.C. for Town Clerk and Town Council; and U.D.C. for Urban District Council.

BUILDING.

NOVEMBER 15.

Norfolk C.C.—Small (25 persons) brick and concrete shelter at Acle. County Architect, 25, Thorpe-rd., Norwich.

NOVEMBER 16.

***Banstead U.D.C.**—Public surface shelters. F. H. Wiltshire, C.

Glamorgan C.C.—Works at Abercynon police station. D. J. Parry, Deputy Clerk of C.C., County Hall, Cardiff.

Honiton T.C.—Four surface shelters to seat 50 persons each. J. W. Jones, B.E. and S.

Stroud U.D.C.—Underground shelter to accommodate 200 persons, and 2 surface shelters, accommodating 150 and 50 persons each. F. Foster Langley, E. and S.

NOVEMBER 18.

Birkenhead T.C.—Auxiliary fire station. B.E. and S. Dep. £1 1s.

Chertsey U.D.C.—36 50-person shelters. W. V. Davies, E. and S.

Grimsby E.C.—Improvements to conveniences at Edward-st. schools. J. V. Oldfield, B.E. and S., 170, Victoria-st. Dep. £2 2s.

Kirkcaldy T.C.—Domestic surface shelters. B.E.

NOVEMBER 19.

***Cheltenham T.C.**—Twelve public shelters. G. Gould Marsland, B. and Water E.

Ealing T.C.—Taking down building over humus tanks, Northern Works, Perivale, and erection as paper baler house, Greenford destructor works. C. W. Seddon, B.E. Dep. £2 2s.

Liverpool T.C.—Extension to city technical college, Fontenoy-st. City Architect and Director of Housing, Blackburn-chambs., Dale-st., Kingsway. Dep. £2 2s.

NOVEMBER 20.

Rochdale T.C.—Alterations to gentlemen's conveniences in basement of Town Hall. B.S.

Stourbridge T.C.—140 domestic surface shelters, 8 wardens' posts and concreting and waterproofing of Anderson shelters. G. N. Maynard, B.E. and S.

Tottington U.D.C.—Communal shelters. L. Kenyon, S.

NOVEMBER 22.

Dublin T.C.—455 four-roomed houses with estate office, annexe, on Crumlin North housing area, section No. 1B. H. G. Simms, Housing Architect, 5, Wellington Quay. Dep. £5 5s.

Wolverhampton C.B.—Domestic surface shelters. B.E. Dep. £2 2s.

NOVEMBER 23.

Bridgnorth T.C.—Bungalow at pumping station. I. M. Nicholson, B.E.

NOVEMBER 26.

Rickmansworth U.D.C.—Brick public surface shelter, adjoining Croxley Green L.M.S. Station. S.

NOVEMBER 27.

Epsom and Ewell T.C.—Public surface shelters to accommodate approx. 3,000 persons. Norman Auty, B.E. Dep. £2 2s.

***Stroud U.D.C.**—Communal domestic shelters. F. Foster Langley, E. and S.

NOVEMBER 28.

Stratford-on-Avon R.D.C.—Works at fire station, Henley-in-Arden. H. J. Weeks, S., 11, Guild-st.

NOVEMBER 29.

***Wrexham T.C.**—Extensions to public abattoir. B.E., 1, Grosvenor-rd.

DECEMBER 11.

Belper U.D.C.—3 small brick buildings, concrete contact chambers and appurtenant pipe work and installation of special dosing apparatus in connection with chlorination of water supplies. G. and F. W. Hodson, consulting engineers, Bank-chambs., Loughborough, or W. H. Wheeldon, S. Dep. £2 2s.

PAINTING, ELECTRIC LIGHTING, HEATING, &c.

NOVEMBER 18.

Batley E.C.—Internal painting of certain schools. B.E., Brunswick-st.

Bury T.C.—Internal decoration and painting of kennels, Castle-chambs., Market-pl. B.E., Bank-st.

Langport R.D.C.—Exterior and interior painting of 90 council houses. A. Ford, Building S., North-st.

Newcastle-under-Lyme R.D.C.—External decoration of 32 houses. S. E. Lovatt, C., Public Offices, Croft-st.

NOVEMBER 25.

West Riding C.C.—Improvements at Carlton-in-Snaith school. Education Officer, County Hall, Wakefield.

MATERIALS.

NOVEMBER 19.

Felling-on-Tyne U.D.C.—Highway materials, etc. S.

NOVEMBER 20.

Tyrone C.C.—Supply of tar-bitumen mixture and cold bitumen emulsion. B. G. L. Glasgow, C.S., Omagh.

NOVEMBER 21.

Belfast T.C.—Chemical closets. Education Architect, Victoria-st.

NOVEMBER 22.

Antrim C.C.—Tar and other road surface dressing materials. C.S., Belfast.

NOVEMBER 25.

Northwich R.D.C.—Pipes and valves, etc., for joint "Minor" water scheme. J. Birtwistle, E., Whitehall, Hartford, Northwich.

DECEMBER 12.

South Africa.—Electric light fittings for new G.P.O. at Bloemfontein, for Public Works Dept. Chairman, Union Tender and Supplies Board, P.O. Box 371, Pretoria, South Africa. (Ref. T. 22426/40.)

FEDERATED EMPLOYERS'
Insurance Association Ltd.
(non-tariff)
Head Office:
8, King St., Manchester
London Office:
23, Lawrence Lane, Cheapside, London, E.C.2
All Classes of Insurance Transacted
(Except Life and Marine)
The Leading Office for
Contract Guarantee Bonds

ENGINEERING, IRON AND STEEL.

NOVEMBER 16.

Ilford T.C.—Culverts and other drainage works. B.E. Dep. £2 2s.

Kildare Board of Health.—Monasterevan waterworks scheme. N. O'Dwyer, Consulting E., 6, Burlington-rd., Dublin. Dep. £5 5s.

NOVEMBER 21.

South African Public Works Dept., Johannesburg. — Ventilating plant, new General Post Office, Cape Town. Chairman, Union Tender and Supplies Board, P.O. Box 371, Pretoria. Dept. of Overseas Trade. (Ref. T. 22061/40.)

NOVEMBER 22.

Manchester T.C. — Reinforced concrete water-cooling tower at generating station. H. C. Lamb, Chief Engineer and Manager, Electricity Dept. Dep. £1 1s.

NOVEMBER 28.

Greenock Harbour Trust.—Reconstruction of Princes Pier. Donald Smith, Harbour E. Dep. £3 3s.

NOVEMBER 30.

Marlow Water Company.—Covered service reservoir. Messrs. Roffe and Raffety, Engineers, 42, Salisbury-av., Cheam. Dep. £2 2s.

ROAD, SEWERAGE AND WATER WORKS.

NOVEMBER 15.

Chesterton R.D.C. — Laying-on water services to 6 houses in Waterbeach. G. G. Bennett, Deputy S., The County Hall, Hobson-st., Cambridge. Dep. 10s. 6d.

NOVEMBER 16.

Plymouth T.C.—280 yds. 18-in. and 1,450 yds. 21-in. class "C" spun cast-iron pipes, concrete lined, B.S.; about 20 tons special castings. Water E., 22, Portland-sq.

NOVEMBER 18.

Brighouse T.C.—Resurfacing of a portion of Liverpool-Leeds-Hull trunk road, at Cooper Bridge. B.E. and S. Dep. £1 1s.

NOVEMBER 20.

Cheadle and Gatley U.D.C.—Reinforced concrete twin box culvert and surface-water sewers. J. Wrest, E. and S. Dep. £1 1s.

NOVEMBER 25.

Northwich R.D.C.—Brick borehole pumphouse at Delamere and laying of various mains, etc. J. Birtwistle, E., Whitehall, Hartford, Northwich. Dep. £2 2s.

NOVEMBER 28.

Lunesdale R.D.C.—Laying of 3-in. and 4-in. asbestos cement water mains, construction of booster pumphouse, and other incidental works, in three parishes. A. R. Harlow, C., Council Offices, Hornby, near Lancaster. Dep. £1 1s.

Public Appointments.

NOVEMBER 16.

***Barnet R.D.C.** — Temporary General Assistant. A. J. Wilshire, E. and S.

NOVEMBER 18.

***Staffs C.C.** — Temporary Architectural Assistant. H. L. Underwood, C., Stafford.

***Thurrock U.D.C.**—Temporary technical assistants. E. and S.

NOVEMBER 19.

***Leeds T.C.** — Temporary Architectural Assistant. W. S. Cameron, City E.

NOVEMBER 27.

***Gravesend T.C.**—Temporary architectural assistant. H. H. Brown, T.C.

NEW BUILDINGS IN LONDON

DAGENHAM.—BUILDINGS. — Plans have been passed by the T.C. for an office building and factory extension for Messrs. Briggs Motor Bodies, Ltd.; alterations for the Windsor Hosiery Co., Ltd., and for a building for Messrs. May and Baker, Ltd.

WALTHAMSTOW.—BUILDING.—The T.C. has approved the following plans: Extensions to factories for Messrs. Robinson and Son; Powers and Deane, Ltd.; and A. W. Yelland.

Hull Shrievalty.

Mr. R. G. Tarran has accepted an invitation to be Sheriff of Hull next year. Mr. Tarran, who is the founder and chairman of Tarran Industries, Ltd., is Hull's chief air-raid warden.

RATES OF WAGES IN THE BUILDING TRADE

AS AND FROM 1st JUNE, 1940

[Every endeavour is made to ensure accuracy, but we cannot be responsible for errors]

	Craftsmen.	Labourers.
Aberavon	1/9	1/4½
Aberdare	1/9	1/4½
Abergavenny	1/9	1/4½
Abingdon	1/7½	1/3
Accrington	1/9	1/4½
Aldeburgh	1/5½	1/1½
Aldershot	1/7½	1/3
Alfreton	1/9	1/4½
Alnwick	1/8½	1/3½
Altrincham	1/9	1/4½
Amble	1/8½	1/3½
Amersham	1/7½	1/3
Ammanford	1/9	1/4½
Andover	1/7	1/2½
Ardingley	1/7	1/2½
Arundel	1/7	1/2½
Ascot	1/7	1/2½
Ashby-de-la-Zouch	1/9	1/4½
Ashford (Kent)	1/7	1/2½
Ashford (Middlesex)	1/9	1/4½
Ashington	1/8½	1/3½
Ashtead	1/9	1/4½
Ashton-under-Lyne	1/9	1/4½
Aylesbury	1/7	1/2½
Aylsham	1/6	1/2
Bagshot	1/7	1/2½
Banbury	1/7	1/2½
Barnsley	1/9	1/4½
Barnstaple	1/7	1/2½
Barrow-in-Furness	1/9	1/4½
Barry	1/9	1/4½
Basingstoke	1/7	1/2½
Bath	1/8½	1/3½
Batley	1/9	1/4½
Beaconsfield	1/7½	1/3
Beccles	1/5½	1/1½
Bedford	1/8½	1/3½
Berkhamsted	1/7	1/2½
Berwick	1/8½	1/3½
Beverley	1/9	1/4½
Bexhill-on-Sea	1/7½	1/3
Bideford	1/7	1/2½
Biggleswade	1/7	1/2½
Billericay	1/6½	1/2½
Birchington	1/7	1/2½
Birkenhead	‡§1/11	¶
Birmingham†	1/9	1/4½
Bishop Auckland	1/9	1/4½
Bishops Stortford	1/8	1/3½
Blackburn	1/9	1/4½
Blackpool	1/9	1/4½
Blyth	1/9	1/4½
Bognor Regis	1/7	1/2½
Bolton	1/9	1/4½
Bournemouth	1/8	1/3½
Bracknell	1/7	1/2½
Bradford	1/9	1/4½
Bradford-on-Avon	1/6	1/2
Braintree	1/7	1/2½
Brentwood	1/8½	1/3½
Bridgwater	1/7½	1/3
Bridlington	1/8½	1/3½
Brighouse	1/9	1/4½
Brighton	1/8	1/3½
Bristol	1/9	1/4½
Broadstairs	1/7	1/2½
Bromsgrove	1/8½	1/3½
Buckley	1/9	1/4½
Bungay	1/5	1/1½
Burnham-on-Crouch	1/5½	1/1½
Burnley	1/9	1/4½
Burslem	1/9	1/4½
Burton-on-Trent	1/9	1/4½
Bury	1/9	1/4½
Bury St. Edmunds	1/6½	1/2½
Buxton	1/8½	1/3½
Byfleet	1/7½	1/3
Cambridge	1/9	1/4½
Canterbury	1/7	1/2½
Cardiff	1/9	1/4½
Carlisle	1/9	1/4½
Carnforth	1/9	1/4½
Castleford	1/9	1/4½
Caterham	1/9	1/4½
Chard	1/6	1/2
Chatham	1/8	1/3½
Chelmsford	1/8½	1/3½
Cheltenham	1/8	1/3½
Chepstow	1/8½	1/3½
Chertsey	1/8	1/3½
Chester	1/9	1/4½
Chesterfield	1/9	1/4½
Chichester	1/7	1/2½
Chorley	1/9	1/4½
Cirencester	1/6½	1/2½
Clacton	1/7	1/2½
Cleveleys	1/9	1/4½
Clitheroe	1/9	1/4½
Cobham (Surrey)	1/8	1/3½
Colchester	1/8½	1/3½
Colwyn Bay	1/8	1/3½
Congleton	1/8½	1/3½
Coventry	1/9	1/4½
Cranbrook	1/7	1/2½
Cranleigh	1/7	1/2½
Crawley	1/7	1/2½
Crewe	1/8½	1/3½
Cromer	1/6	1/2
Crowborough	1/7	1/2½
Cuckfield	1/7	1/2½
Darlington	1/9	1/4½
Darwen	1/9	1/4½
Daventry	1/7½	1/3
Deal	1/7	1/2½
Denbigh	1/8	1/3½
Derby	1/9	1/4½
Devizes	1/6	1/2
Dewsbury	1/9	1/4½
Didcot	1/7	1/2½
Diss	1/5½	1/1½
Doncaster	1/9	1/4½
Dorchester	1/6½	1/2½
Dorking	1/7½	1/3
Dover	1/7	1/2½
Dovercourt	1/7	1/2½
Driffield	1/7½	1/3
Droitwich	1/8½	1/3½
Dudley	1/9	1/4½
Dunstable	1/7½	1/3
Durham City	1/9	1/4½
Eastbourne	1/8	1/3½
E. Glam. (Mon. Val.)	1/9	1/4½
East Grinstead	1/7	1/2½
Edenbridge	1/7	1/2½
Ely	1/6	1/2
Epping	1/9	1/4½
Exeter	1/8½	1/3½
Exmouth	1/7½	1/3
Fakenham	1/6	1/2
Falmouth	1/7½	1/3
Fareham	1/8	1/3½
Faversham	1/7	1/2½
Felixstowe	1/8	1/3½
Filey	1/7½	1/3
Fleetwood	1/9	1/4½
Flint	1/9	1/4½
Folkestone	1/7	1/2½
Frinton-on-Sea	1/7	1/2½
Frome	1/6	1/2
Gainsborough	1/8	1/3½
Gateshead	1/9	1/4½
Gillingham (Kent)	1/8	1/3½
Glossop	1/9	1/4½
Gloucester	1/8½	1/3½
Godalming	1/7	1/2½
Goole	1/9	1/4½
Gosport	1/8½	1/3½
Grantham	1/8	1/3½
Gravesend	1/8½	1/3½
Great Yarmouth	1/7	1/2½
Grimsby	1/9	1/4½
Guildford	1/7	1/2½
Guilsborough	1/7½	1/3
Halifax	1/9	1/4½
Hanley	1/9	1/4½
Harpenden	1/8	1/3½
Harrogate	1/9	1/4½
Hartlepools	1/9	1/4½
Harwich	1/7	1/2½
Haslemere	1/7	1/2½
Hastings	1/7	1/2½
Hatfield	1/8½	1/3½
Haywards Heath	1/7	1/2½
Hednesford	1/8½	1/3½
Hemel Hempstead	1/8	1/3½
Henley-on-Thames	1/7	1/2½
Hereford	1/7	1/2½
Herne Bay	1/7	1/2½
Hertford	1/8½	1/3½
Heysham	1/9	1/4½
Hitchin	1/8	1/3½
Hoddesdon	1/8½	1/3½
Holt (Norfolk)	1/5½	1/1½
Horley	1/7	1/2½
Horsham	1/7	1/2½
Horwich	1/9	1/4½
Huddersfield	1/9	1/4½
Hull	1/9	1/4½
Hunstanton	1/6	1/2 •
Huntingdon	1/6½	1/2½
Ilfracombe	1/7	1/2½
Ingatestone	1/7½	1/3
Ipswich	1/8½	1/3½
Isle of Thanet	1/7	1/2½
Isle of Wight	1/6½	1/2½
Keighley	1/9	1/4½
Kenilworth	1/9	1/4½
Kettering	1/9	1/4½
Kidderminster	1/8½	1/3½
King's Lynn	1/7	1/2½
Kirkham	1/9	1/4½
Knowle	1/8½	1/3½
Lancaster	1/9	1/4½
Leamington	1/9	1/4½
Leatherhead	1/8	1/3½
Leeds	1/9	1/4½
Leicester	1/9	1/4½
Leighton Buzzard	1/6	1/2
Letchworth	1/8	1/3½
Lewes	1/7	1/2½
Lichfield	1/8	1/3½
Lincoln	1/9	1/4½
Littlehampton	1/7	1/2½
Liverpool	‡§1/11	¶
Llandudno	1/8	1/3½
Llanelly	1/9	1/4½
London—		
12m. radius	•1/10½	1/5½
12-15 m. radius	•1/10	1/5
Long Eaton	1/9	1/4½
Longton	1/9	1/4½
Loughborough	1/9	1/4½
Louth	1/7½	1/3
Lowestoft	1/7	1/2½
Luton	1/8½	1/3½
Macclesfield	1/8½	1/3½
Maidenhead	1/8	1/3½
Maidstone	1/7½	1/3
Malvern	1/7½	1/3
Manchester	1/9	1/4½
Manningtree	1/6	1/2
Mansfield	1/9	1/4½
March	1/6	1/2
Margate	1/7	1/2½
Market Harborough	1/8	1/3½
Matlock	1/7½	1/3
Melton Constable	1/5½	1/1½
Melton Mowbray	1/8	1/3½
Merthyr	1/9	1/4½
Middlesbrough	1/9	1/4½
Middleton	1/9	1/4½
Middlewich	1/8½	1/3½
Milford Haven	1/7½	1/3
Morecambe	1/9	1/4½
Morley	1/9	1/4½
Mundesley	1/6	1/2
Nantwich	1/8½	1/3½
Nelson	1/9	1/4½
Newark-on-Trent	1/8½	1/3½
Newbury	1/7	1/2½
Newcastle-on-Tyne	1/9	1/4½
Newcastle-u.-Lyme	1/9	1/4½
New Forest	1/7	1/2½
Newmarket	1/7	1/2½
Newport, Mon.	1/9	1/4½
Newport Pagnell	1/7	1/2½
Northampton	1/9	1/4½
Norwich	1/9	1/4½
Nottingham	1/9	1/4½
Nuneaton	1/9	1/4½
Oakham	1/7½	1/3
Oldham	1/9	1/4½
Ormskirk	1/9	1/4½
Oxford	1/8½	1/3½
Oxted	1/7½	1/3
Paignton	1/8½	1/3½
Peterborough	1/8½	1/3½
Plymouth	1/9	1/4½
Pontefract	1/9	1/4½
Pontypridd	1/9	1/4½
Port Talbot	1/9	1/4½
Portsmouth	1/8½	1/3½
Preston	1/9	1/4½
Pulborough	1/7	1/2½
Ramsgate	1/7	1/2½
Reading	1/8½	1/3½
Redditch	1/8½	1/3½
Redhill	1/7½	1/3
Ripon	1/7½	1/3
Rochdale	1/9	1/4½
Rochester	1/8	1/3½
Rugby	1/9	1/4½
Saffron Walden	1/6	1/2
St. Albans	1/8½	1/3½
St. Helens	1/9	1/4½
St. Neots	1/6½	1/2½
Salisbury City	1/6½	1/2½
Salisbury Plain	1/8	1/3½
Sawbridgeworth	1/7½	1/3
Saxmundham	1/5½	1/1½
Scarborough	1/8½	1/3½
Scunthorpe	1/9	1/4½
Selby	1/9	1/4½
Sevenoaks	1/7½	1/3
Sheerness	1/7	1/2½
Sheffield	1/9	1/4½
Shipley	1/9	1/4½
Shoeburyness	1/8½	1/3½
Shoreham	1/8	1/3½
Shrewsbury	1/8½	1/3½
Sittingbourne	1/7	1/2½
Skegness	1/8	1/3½
Sleaford	1/7½	1/3
Slough	1/8	1/3½
Southampton	1/8½	1/3½
Southend-on-Sea	1/8½	1/3½
Southport	1/9	1/4½
South Shields	1/9	1/4½
Spalding	1/7	1/2½
Stafford	1/8½	1/3½
Staines	1/8	1/3½
Stamford	1/8	1/3½
Stevenage	1/8	1/3½
Stockport	1/9	1/4½
Stockton-on-Tees	1/9	1/4½
Stoke-on-Trent	1/9	1/4½
Stourbridge	1/9	1/4½
Stourport	1/8½	1/3½
Stowmarket	1/6	1/2
Stratford-on-Avon	1/8	1/3½
Stroud	1/8	1/3½
Sunderland	1/9	1/4½
Sutton Coldfield	1/9	1/4½
Swaffham	1/5½	1/1½
Swanage	1/7	1/2½
Swansea	1/9	1/4½
Swindon	1/7½	1/3
Tamworth	1/8½	1/3½
Taunton	1/7½	1/3
Tenterden	1/7	1/2½
Thames Haven	1/9	1/4½
Thetford	1/6½	1/2½
Thorpe Bay	1/8½	1/3½
Todmorden	1/9	1/4½
Tonbridge	1/7½	1/3
Torquay	1/8½	1/3½
Totnes	1/7	1/2½
Trowbridge	1/6	1/2
Truro	1/6½	1/2½
Tunbridge Wells	1/7½	1/3
Uppingham	1/7½	1/3
Uttoxeter	1/7½	1/3
Wakefield	1/9	1/4½
Walsall	1/9	1/4½
Walsden	1/9	1/4½
Walton-on-Naze	1/7	1/2½
Ware	1/8½	1/3½
Warminster	1/6	1/2
Warrington	1/9	1/4½
Warwick	1/9	1/4½
Wellingborough	1/8½	1/3½
Welwyn	1/8	1/3½
Welwyn Gar. City	1/9	1/4½
Wells (Norfolk)	1/5½	1/1½
West Bromwich	1/9	1/4½
Westcliff-on-Sea	1/8½	1/3½
Weston-super-Mare	1/8	1/3½
Weybridge	1/8	1/3½
Weymouth	1/7	1/2½
Whitby	1/8	1/3½
Whitstable	1/7	1/2½
Widnes	1/9	1/4½
Wigan	1/9	1/4½
Wigton	1/7½	1/3
Willington	1/9	1/4½
Wilmslow	1/9	1/4½
Winchester	1/7½	1/3
Windermere	1/7½	1/3
Windsor	1/8	1/3½
Wisbech	1/6½	1/2½
Witham	1/7	1/2½
Woking	1/7½	1/3
Wokingham	1/7	1/2½
Wolverhampton	1/9	1/4½
Woodbridge	1/6½	1/2½
Worcester	1/8½	1/3½
Workington	1/7½	1/3
Worksop	1/8½	1/3½
Worthing	1/7	1/2½
Wrexham	1/8½	1/3½
Wroxham	1/6½	1/2½
Wycombe	1/8	1/3½
Wymondham	1/6	1/2
Yeovil	1/7½	1/3
York	1/9	1/4½

• Painters 1d. less than other Craftsmen. † Plus 2d. per working day. ‡ Plasterers 1/11½.
¶ Tradesman's Labourers 1/5½. Navvies and General Labourers 1/4½.
§ Joiners, Plumbers, Bricklayers, Tilers and Masons receive 2/- per week or 4d. per day Tool Money.

For Building Trade Wages in Scotland, see page 494.

PRICES CURRENT OF MATERIALS *

Note: Owing to the exceptional circumstances which prevail at the present time prices of materials should be confirmed by inquiry. The prices for soft woods are for cash on delivery, and are subject to adjustment when the increased price of £22 per standard for national released stocks is finally fixed. At present linseed oil and genuine spirits of turpentine can only be supplied in cans in small quantities.

BRICKS, &c.

Delivered to site, City and Central Area, Full Lorry Loads. £ s. d.
Best Stocks 4 18 0
Second Hard Stocks 4 11 0

Per 1,000. Delivered at London Goods Stations.

2½ in. Phorpres. A discount of 6d. 1,000 only monthly account.	King's Cross Station per 1,000. s. d.	To sites in W.C. District. per 1,000 s. d.
Pressed	51 0	57 0
Keyed	53 0	59 0
Single Bullnose	71 0	77 0
Rustics	71 0	77 0
Whites	71 0	77 0

White Midhurst Facing Bricks (delivered London site) ..... £ s. d. 3 12 6
Best blue Pressed Staffs. (London Stns.) 8 18 0
Do. Bullnose (London Stns.) 9 8 0
Blue Wire Cuts (London Stns.) 7 15 0
Best Stourbridge Fire Brick (London Stns.):—
2½ in. ..... 8 0 0 3 in. 9 15 0

GLAZED BRICKS. (London Stns.)

Best White Ivory and Salt Glazed Stretcher	26 0 0	D'ble Str'tch'rs .. D'ble Headers .. One side & two ends	34 10 0 31 10 0 35 10 0
Headers	25 10 0	Two sides & one end	36 10 0
Quoins, Bullnose and 4½in. Flats	32 10 0	Splays and Squints	34 0 0

Second Quality, £2 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours. Hard Glaze, £5 10s. extra over white.

PARTITION SLABS.

Delivered London Area.

"PHORPRES" HOLLOW PARTITION BLOCKS.

2" per yd. sup.	2 3	3" per yd. sup.	2 9
2½ " "	2 6	4" "	3 1

CLINKER CONCRETE.

2" per yd. sup.	1 6	3" per yd. sup.	2 0
2½ " "	1 8	4" "	2 4

CRANHAM TERRA COTTA.

2" per yd. sup.	3 0	3" per yd. sup.	3 8
2½ " "	3 6	4" "	4 7

HEMPSTEAD—KEYED TWO SIDES.

12" x 9" x 2"	2 6	12" x 9" x 3"	3 0
12" x 9" x 2½"	2 9	12" x 9" x 4"	3 9

Per yard super d/d. Free on site, London.

SAND.

Thames Ballast	7	9	per yd.
Pit Ballast	7	3	" "
Pit Sand	9	9	" "
Washed Sand	10	9	" "
¼ in. Shingle	8	0	" "
¾in. Broken Brick	12	0	" "
Pan Breeze	8	3	" "

delivered 2 miles radius Paddington.

CEMENT.

Best British Portland Cement. Standard Specification delivered London Area. £ s. d.
4 ton loads and upwards site ..... Per ton 2 4 6
1 ton to 4 tons site 2 7 6
Alongside Vauxhall in 80 ton lots 2 2 0
"Ferrocrete" Rapid Hardening Cement—
4 ton loads and upwards site 2 10 6
1 ton to 4 tons site 2 13 6
Alongside Vauxhall in 80 ton lots 2 8 0
Stored in Reserved Bins at works. 1/6 per ton extra.
"Aquacrete" Water Repellent, "Blue Circle" cement, 30/- per ton extra or ordinary "Blue Circle" prices.
"Colorcrete" Nos. 1 and 2. Coloured Rapid Hardening Portland Cement 3 14 6
"Colorcrete" not rapid hardening, according to colour, from £7 to £15 10s. per ton.
"Snowcrete" White Portland Cement 9 5 0
Super Cement (Waterproof) 3 14 6

NOTE.—Paper bags will be charged at the rate of 5/- nett per ton. Jute sacks charged 1s. 9d. nett each and 1/6 nett each allowed if returned to works within two weeks, in good condition.
Carriage will be paid by makers on returned empty jute sacks.
Roman Cement £7 5 Keene's Cement, White £6 10 0
Parian Cement 6 10 " " Pink 6 5 0
Cementone Colours for cement according to tints per cwt. from £2 16s. 0d.

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	3 12 6	Sirapite, Coarse	4 3 0
" White	4 0 0	" Finish	4 11 0
Pioneer	4 3 0		

Above prices for 4-ton loads and over London Area.

Best Ground Blue Lias Lime	2 17 6	Grey Stone Lime Chalk Lime	2 12 6 2 12 6
Granite Chippings	1 10 0	Hair per cwt.	2 7 6

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d., if returned in good condition within three months, carriage paid.
Stourbridge Fireclay in sacks 37s. per ton at rly. dep.

STONE.

BATH STONE.—Delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube ..... s. d. 2 11½
BEER STONE—RANDOM BLOCK—
Free on rail at Seaton Station..per ft. cube 2 3
Delivered free on rail Nine Elms, S.R. " 3 1½
Selected approximate size one way, 1d. per cubic ft. extra, selected approximately three sizes or for special work, 3d. per cubic ft. extra.

PORTLAND STONE—
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube ..... s. d. 4 6
Do. do. delivered on road waggons as above stations, per ft. cube 4 6
White basebed, 3d. per ft. cube extra.
NOTE.—1d. per ft. cube extra for every ft. over 20 ft. *average* and ½d. beyond 30 ft.
HOPTON-WOOD STONE—
F.O.R. Quarries, Wirksworth, Derbyshire, Random blocks from 10 ft. and over P.ft.cb. 14 0
Sawn two sides 22 6
HOPTON-WOOD STONE—
Sawn three or four sides 27 0
YORK STONE, BLUE—*Robin Hood Quality.*
Delivered at any Goods Station, London.
6 in. sawn two sides landings to sizes (under 30 ft. super) .....per ft.super 5 6
6 in. rubbed two sides, ditto .... " 6 3
3 in. sawn two sides slabs (random sizes) ..... " 2 7
2 in. to 2½ in. sawn one side slabs (random sizes) (paving) ..... " 1 8½
1½ in. to 2 in., ditto ..... " 1 4½
HARD YORK—
Delivered at any Goods Station, London.
Scrappled random blocks.....per ft. cube 6 10
6 in. sawn two sides landings to sizes (under 40 ft. super) .....per ft.super 5 7½
6 in. rubbed two sides, ditto .... " 6 9
4 in. sawn two sides slabs (random sizes) ..... " 3 5
3 in. ditto ditto ..... " 2 8
2 in. self-faced random flags .....Per yd. super 8 9

CAST STONE.

Delivered in London are in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Sills, 10s. 0d.

HARD WOOD.

1 INCH AND UP THICK.

	£ s. d.
Average price for prime quality.	
Dry Austrian Wainscot, per ft. cube	0 17 0
Dry American and/or Japanese Figured Oak, per ft. cube .....10 6 to	0 13 0
Dry American and/or Japanese plain Oak, per ft. cube	0 11 6
Dry sq. edged Honduras Mahogany, per ft. cube.....	0 15 0
Dry log-cut Honduras Mahogany, per ft. cube..... 12 6 to	0 16 0
Dry Cuba Mahogany, per ft. cube	0 18 0
Dry Teak, per ft. cube	0 14 0
Dry American Whitewood, per ft. cube	0 10 6
Dry Australian Walnut, per ft. cube	0 19 0
Dry Queensland Silky Oak, per ft. cube	0 12 6
Dry African Mahogany, per ft. cube	0 10 0
Dry African Whitewood, per ft. cube	0 8 0
Dry English Wainscot Oak, per ft. cube	0 16 0
Best Scotch Glue, per cwt.	3 0 0
Liquid Glue, per cwt. .....4 7 0 to	5 10 0

SOFT WOOD.

MERCHANTABLE BRITISH COLUMBIAN PINE.

	Minimum. £ s. d.	Maximum. £ s. d.
Scantlings in imported sizes, 2in. by 3in. to 4in. by 11in.	43 10 0	53 0 0

Having secured the Contract— What about the Steel Scaffolding?

For the lowest Prices apply to the Oldest Firm in The Scaffolding Trade.

STEPHENS & CARTER LTD.
The British Steel Scaffolding Co.
731-761, HARROW RD., N.W.10.
Telephone No. Ladbroke 1191 (6 lines).

PLANED BOARDS.

PRIME CLEAR BRITISH COLUMBIAN PINE.

	Per standard. £ s. d.
11in. by 11in. } 11in. by 9in. }	67 10 0

	Per square. s. d.
11in. plain edge flooring	53 0
1¼in. ditto	66 6
11in. tongued and grooved	53 0
1¼in. ditto	66 6

MATCHING.

	Per square. s. d.
⅜in.	37 6
½in.	42 0
1in.	55 0

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	31 13 6	18 by 10	16 15 0
22 by 12	26 12 0	18 by 9	15 7 6
22 by 11	23 18 6	16 by 10	14 11 6
20 by 12	23 8 0	16 by 8.....	11 10 0
20 by 10	21 0 0		

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. .....Per 1,000 f.o.r. London

	£ s. d.
Best machine-made tiles from Broseley or Staffordshire district.....	£4 10 0
Ditto hand-made ditto	5 7 6
Ornamental ditto	5 12 6
Hip and valley tiles (per dozen) { Hand-made.....	0 9 0
{ Machine-made.....	0 8 6

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—

	£ s. d.
R.S. Joists, cut and fitted	£22 10 0
Plain Compound Girders.....	25 0 0
" Stanchions	27 10 0
In Roof Work	32 10 0

NOTE.—These prices are for standard pieces and not special pieces of an awkward nature.
MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£ s. d.	Diameter.	£ s. d.
¼ in.....	22 5 0	⅝ in. to ½ in...	20 15 0
⅜ in.....	21 5 0	⅝ in. to 2¾ in...	20 5 0

WROUGHT TUBES AND FITTINGS.
Deliveries from works.
Deliveries from London stock further 2½% gross.

	Tubes.	Tubulars.	Fittings. 10/17 and 19/24	Flanges.	
	¼"/6" %	¼"/6" %	%	¼"/2" %	2½"/6" %
Light weight ..	55½	—	48	51½	58
Heavy weight ..	48½	48½	40½	41½	50½
Galv.lightweight	44½	—	39½	40½	49½
Galv.heavyweight	35½	35½	31½	30½	41½

Tubes and tubulars sizes ⅛"/⅛" inclusive, charged extra of 5% less gross.
Fittings. Figs. 25/34 5% less gross discount.
Terms.—Nett cash end of month following date of invoice. Carriage paid on lots of £10 nett value and over.

C.I. HALF-ROUND GUTTERS—London Prices ex Works.

per yd. in 6 ft. lengths.	Gutters.	Nozzles.	Stop ends.
3 in.	1/4½	1/1	4d.
3½ in.	1/5½	1/2½	4d.
4 in.	1/5½	1/4½	6½d.
4½ in.	1/6½	1/8	7½d.
5 in.	1/10½	1/11½	8d.

O.G. GUTTERS.

3 in.	1/9	1/5½	4½d.
3½ in.	1/11½	1/5½	6d.
4 in.	1/11½	1/6½	7d.
4½ in.	2/0½	1/9½	8d.
5 in.	2/6	2/0½	9½d.

RAIN WATER PIPES.

Per yd. in 6 fts.	Pipe.	Bends. Stock angles.	Branches.
2 in.	2/0½	1/4½	2/0
2½ in.	2/1½	1/6½	2/4½
3 in.	2/7½	1/11½	2/10½
3½ in.	3/1	2/3½	3/4½
4 in.	3/6½	2/9½	4/0½

NETT PRICES.
Tonnage allowance—4-ton lots, 5 per cent.
2-ton lots, 2½ per cent.
L.C.C. COATED SOIL PIPES.—London Prices, ex Stock.

Per yd. in 6 fts.	Pipe.	Bends.	Branches.
2 in.	3/4½	2/4½	2/10½
2½ in.	4/0½	2/7½	3/7½
3 in.	4/4½	2/10½	4/3½
3½ in.	4/5½	3/7½	5/0½
4 in.	4/10	4/0½	5/9½

L.C.C. COATED DRAIN PIPE.

	Pipe.	Bends.	Branches.
3 in. per yd. in 9 fts.	5/5	6/3	9 11
cwt. qr. lbs.			
4 in. 1 1 20.....	7/11	7/1	12/6
5 in. 1 2 22.....	9/7	12/9	19/3
6 in. 2 0 6.....	11/5	14/8	25/6

Gaskin 65/- per cwt.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information. Prices are subject to 2½ per cent. cash discount.

PRICES CURRENT OF MATERIALS—(*contd.*)

	Per ton basis in London. £ s. d.		£ s. d.
IRON.—Staffordshire Crown, Merchant quality	16 12 6	to	17 17 6
IRON—Staffordshire Marked Bars	19 10 0	to	21 10 0
Mild Steel Bars	17 8 6	to	18 18 6
Mild Steel Hoops	19 2 6	to	19 12 6
	Ex Merchant's Stock, per ton (two-ton lots).		
Soft Steel Sheets, C.R. and C.A.—	£ s. d.		£ s. d.
20 gauge	21 10 0	to	23 17 6
24 gauge	21 15 0	to	23 12 6
26 gauge	22 10 0	to	24 7 6
Galvanised Corrugated Sheets, 6 ft. to 9 ft.—			
20 gauge	23 11 3	to	24 16 3
24 gauge	24 1 3	to	25 6 3
26 gauge	25 6 3	to	27 1 3
Galvanised Flat Sheets, C.R. and C.A.—			
20 gauge	25 1 3	to	26 18 9
24 gauge	25 11 3	to	27 8 9
26 gauge	26 16 3	to	28 13 9
	Per ton.		
	£ s. d.		£ s. d.
Cut Nails, 3 in. and up	23 10 0	to	25 0 0
	ALL NETT.		

METAL WINDOWS.—Standard sizes, suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 1s. 4d. to 1s. 7d. per foot super.

COPPER.

Seamless copper tubes (basis)	per lb.	1/3
Strong sheet	,,	1/6
Thin sheet	,,	1/7
Copper nails	,,	1/6
,, wire	,,	1/6

PLUMBERS' BRASS WORK.

Delivered in London.
Stamped by Met. Water Board.

CRUTCH HEAD S.D. BIB COCKS FOR IRON. EASY CLEAN.

½ in. ¾ in.
34/- 53/- per doz.

CHROMIUM PLATED TOILET S.D. BIB COCKS FOR IRON. EASY CLEAN.

½ in. ¾ in.
50/- 68/- per doz.

S.D. STOP COCKS FOR IRON.

½ in. ¾ in. 1 in. 1¼ in. 1½ in. 2 in.
37/6 53/- 87/- 202/- 288/- 460/- per doz.

S.D.S. COCKS WITH TWO UNIONS FOR LEAD.

½ in. ¾ in. 1 in. 1¼ in. 1½ in. 2 in.
47/- 75/6 120/- 226/- 360/- 588/- per doz.

DOUBLE NUT BOILER SCREWS.

½ in. ¾ in. 1 in. 1¼ in. 1½ in. 2 in.
8/10 9/9 15/9 27/3 44/- 63/6 per doz.

HEAVY CROYDON BALL VALVES. SCREW IRON.

½ in. ¾ in. 1 in. 1¼ in. 1½ in.
45/- 73/- 120/- 204/- 260/- per doz.

CAPS AND SCREWS.

1¼ in. 1½ in. 2 in. 3 in. 3½ in. 4 in.
10/6 12/9 19/3 34/- 48/- 53/- per doz.

BRASS SLEEVES.

1½ in. 2 in. 3 in. 3½ in. 4 in.
9/9 12/6 22/6 33/- 42/- per doz.

DRAWN LEAD TRAPS WITH BRASS CLEANING SCREWS.

	1½ in.	1½ in.	2 in.	3 in.
8 lb. Lead P.	20/-	38/-	54/-	93/- per doz.
8 lb. Lead S.	36/-	42/-	67/-	120/- ,,

SOLDER.—Plumbers, 1/5. Tinmen's, 1/8. Blow pipe, 1/10 per lb.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil, in drums	per gallon	0 5 4
Boiled ,, ,, in drums	,,	0 5 7
Turpentine, in drums (10 gals.)	,,	0 5 3
Genuine Ground English White Lead, per ton (In not less than 5-cwt. casks). Extra for 1-cwt. kegs over 5-cwt. casks is 2/9 cwt.		61 0 0
GENUINE WHITE LEAD PAINT "Father Thames," "Nine Elms," "Park," "Supremus," "St. Paul's," "Morganswyte," "Polacco," "J" Brand, and other best brands (in 14 lb. tins) not less than 5-cwt. lots	per ton delivered	£ s. d. 83 10 0
Red Lead. Dry (packages extra)	per ton	52 0 0
Best Linseed Oil Putty (1 ton lots)	per cwt.	0 17 1½
Size. XD quality	fkn.	0 3 6

Turpentine substitute can be obtained and prices vary according to the quality from 2/9 gallon upwards.

VARNISHES, &c.

		Per gallon.
Oak Varnish	Outside	0 14 0
Fine do.	,,	0 16 0
Fine Copal	,,	0 18 0
Pale Copal	,,	1 0 0
Pale Opal Carriage	,,	1 4 0
Best do.	,,	1 12 0
Floor Varnish	Inside	0 18 0
Fine Pale Paper	,,	0 18 0
Fine Copal Cabinet	,,	1 2 0
Fine Copal Flatting	,,	1 0 0
Hard Drying Oak	,,	0 18 0
Fine Hard Drying Oak	,,	0 19 6
Fine Copal Varnish	,,	1 0 6
Pale do.	,,	1 12 0
Best do.	,,	1 2 6
Best Japan Gold Size		1 12 6
Best Black Japan		0 10 0
Oak and Mahogany Stain (water)		0 12 0
Brunswick Black		0 7 6
Berlin Black		0 14 0
Knotting (patent)		0 15 0
French and Brush Polish		0 12 0
Liquid Dryers in Terebene		0 9 0
Cuirass Black Enamel		0 7 0

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

ORDINARY GLAZING QUALITY (O.Q.) AND SELECTED GLAZING QUALITY (S.Q.).

PER FOOT SUPER.

In sizes not exceeding 80 in. long or 48 in. wide or 110 united inches.

	O.Q.	S.Q.
18 oz. in 300 ft. cases	2⅜d.	2⅞d.
24 oz. ,, 200 ft. ,,	3½d.	4d.
26 oz. ,, 200 ft. ,,	3⅞d.	4½d.
32 oz. ,, 200 ft. ,,	5⅜d.	6⅜d.
24 oz. ,, 300 ft. ,,	3⅜d.	3⅞d.
26 oz. ,, 300 ft. ,,	3⅝d.	4⅜d.
32 oz. ,, 300 ft. ,,	5⅛d.	6⅛d.
18 oz. Obscured Sheet		5⅛d.
24 oz. Obscured Sheet		6⅛d.
Fluted, 21 oz.		9d.
Enamelled, 18 oz.		5⅛d.
,, 24 oz.		6⅛d.

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE AND FIGURED CATHEDRAL, ETC., IN CUT SIZES. Per ft.

Rolled plate, ⅛ in.	5⅞d.
Rough cast double rolled, ¼ in.	6⅛d.
Rough cast double rolled, ⅜ in.	6⅜d.
Figured rolled, and Cathedral, white	6⅜d.
Figured rolled and Cathedral, tinted	9½d.
Rolled Sheet	6d.
Reeded, Broad Reeded, Cross Reeded and Chevron Reeded, ⅛ in. thick	0 10½

Rolled plate is the same price as rough cast double rolled.

	Per ft. s. d.
Wire Rolled, ¼ in. thick	0 9½
Wired Cast, ¼ in. thick	0 9½
Georgian Wired Cast	0 10
"Calorex" Sheet, 21 oz.	2 6
,, ,, 32 oz.	4 0
,, Cast, ¼ in. thick	0 10
,, ,, ⅜ in. thick	1 0
,, ,, ½ in. thick	1 2
Non Actinic Glass, ¼ in. thick	0 9½
,, ,, ,, ⅜ in. thick	1 0
,, ,, ,, ½ in. thick	1 2

"VITA" GLASS.

	Per ft. s. d.
"Vita" Plate Glass, about ⅛ thick:	
To 7 ft. super	5 0
Over 7 ft. super	7 6
"Vita" Sheet Glass, about 18/20 oz.	2 0
Cathedral "Vita" Glass:	
1/16" thickness	2 0
3/16" ,,	3 0
3/16" Georgian Wired "Vita" Glass	3 6

LEAD, &c.

(Delivered in London.)	Per ton. £ s. d.
LEAD.—Sheet, English, 4 lb. and up	34 10 0
Pipe in coils	34 0 0
Soil pipe	39 10 0
Compo pipe	41 5 0

NOTE.—Country delivery, 20/- per ton extra, lots under 3 cwt. 4/- per cwt. extra and over 3 cwt. and under 5 cwt., 2/6 per cwt. extra. Cut to sizes, 4/- per cwt. extra.

Old lead, ex London area, at Mills ..... per ton £18 0 0.

BUILDING TRADE WAGES IN SCOTLAND

Following are grade rates authorised by the Scottish N.J.C. from October 1. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur.

Grade Classification	A	A¹	A²	A³	B	B¹
Craftsmen	1/10	1/9½	1/9	1/8½	1/8	1/7½
Labourers	1/4½	1/4¼	1/3¾	1/3½	1/3	1/2¾

Aberdeen	A	Dumfriesshire	A²	Inverness	A²
Ayrshire	A	Dundee	A	Inverurie	A¹
Banff	B	Dunoon	A	Kincardineshire	A²
Berwickshire	A²	East Fife	A	Kinross-shire	A
Bridge of Allan	A	East Lothian	A	Lanarkshire	A
Broughty Ferry	A	Edinburgh	A	Midlothian	A
Clackmannanshire	A	Fifeshire	A	Monifieth	A
Doune	A	Forfarshire	A²	Moray and Nairn	B
Dunblane	A	Glasgow	A	Newport	A
Dumbartonshire	A	Greenock	A	Peeblesshire	A²
Dumfries	A¹	Hamilton	A	Perth	A
Perthshire	A²				
Peterhead	A¹				
Renfrewshire	A				
Rothesay	A				
Roxburghshire	A²				
St. Andrews	A				
Selkirkshire	A²				
Stewartry	A²				
Stirlingshire	A				
Stornoway	A²				
Tayport	A				
West Lothian	A				

¹ This town has its own rates: Masons, 1/8; Carpenters, 1/8; Slaters, 1/8; Plumbers, 1/8½; Plasterers, 1/9 but 1/9½ is paid owing to the scarcity at present; Painters, 1/8 and Labourers, 1/3½.

The information given in this table is copyright. Rates of wages in England and Wales are given on page 492.

THE SCOTTISH BUILDER

NEW BUILDINGS

DUNDEE.—BUILDINGS.—Plans and sections of the following proposed new buildings, etc., have been lodged at the office of the City Engineer: 5, West Dock-street—roofing over open yard for Robert Wilson (architects, Allan and Friskin, 26, Castle-street); 27, Reform-street—shop front for Dundee Pasteurised Milk Co., Ltd. (architects, Heggie and Aitchison, Ltd., 54, Duff-street, Edinburgh.

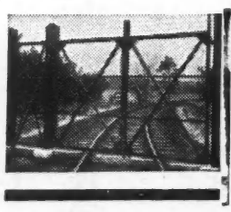
FALKIRK.—FIRE STATION.—The T.C. has instructed Mr. J. G. Callander, architect, Falkirk, to prepare plans for a new fire station.

GLASGOW. — GARAGE, ETC. — Mr. T. Cordiner, 261, West George-street, Blythswood, is the architect for new garage buildings for Messrs. Ross's Dairies, Ltd.

GLASGOW.—ADDITIONS.—Mr. R. Ewan, Wellington-chambers, Waterloo-street, Blythswood, is the architect for alterations and additions to the St. Lawrence Parish Church of Scotland.

KILMARNOCK.—WORKSHOP.—The Dean of Guild Court has approved plans submitted by Messrs. Walker and Templeton, 43, Portland-street, for a small workshop.

LANARKSHIRE.—POLICE STATION.—The C.C. are to proceed immediately with a police station and decontamination centre. Plans by the County Architect, 34, Albert-street, Motherwell.



Fencing and Gates

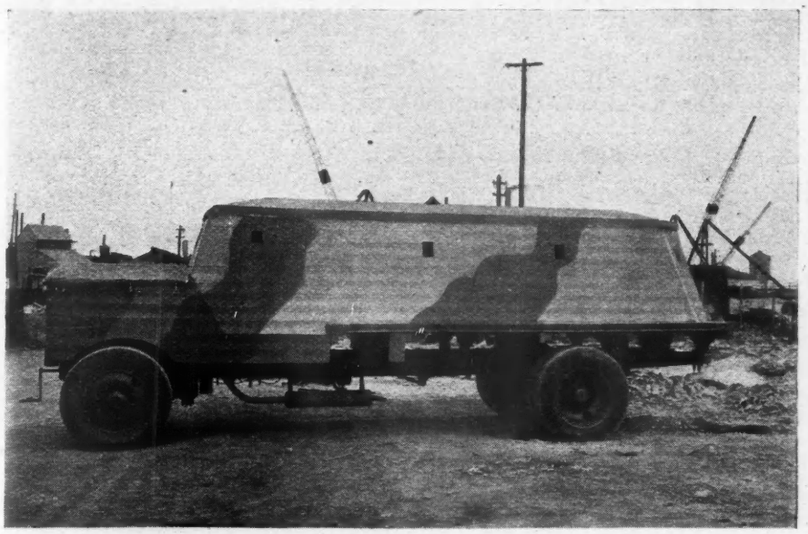
For Government Contracts and similarly important present-day requirements, let Boulton & Paul carry the whole of your Fencing commitment. Skilled erectors, first-class materials—in all, **a dependable service for urgent contracts.** Estimates without delay. 'Phone Norwich 851 (London: Victoria 8001) or write

Boulton & Paul Ltd
London: Horseferry House, S.W.1 Norwich

OFFICIAL NOTIFICATIONS

Executing First-Aid Repairs.

Statements have recently been made in some newspapers that the Ministry of Health have sent a circular to local authorities stating that householders whose property requires first-aid repairs may give instructions to a private builder for the work to be done and that the cost will be met by the local authority. This statement is incorrect. No such circular has been issued and the position is that the owner will be responsible for the cost of repairs to his house unless arrangements with the builder have been made by, or with the prior approval of, the local authority; in which event the cost will form a charge on the property and no payment from the owner will be called for until after the war. Unless, therefore, an owner is prepared to finance the cost of the repairs himself, he should consult the local authority before taking action.



A CONCRETE-ARMOURED ARMY LORRY.

TRADE NEWS

Change of Address.

The English Joinery Manufacturers' Association has transferred its offices to the Goring Hotel, Grosvenor-gardens, S.W.1. Telephone: Vic. 8211 (Ext. 90).

Woodwork and Joinery.

Messrs. C. H. Johnson & Sons, Ltd., of Adswood-road, Stockport, have opened a new department for the execution of woodwork and joinery of every description.

Paint Remover Officially Approved.

We are informed that "Quicker-Stryp No. 32 Paint Remover" has been approved by the Ministry of Aircraft Production. This well-established product is manufactured and marketed by the Quickstryp Chemical Co., Ltd., of Bradford.

Fireclay Company Appointments.

Mr. R. A. Kirkby has been appointed chairman of the Glenboig Union Fireclay Co., Ltd., Glenboig, and Henry Foster & Co., Ltd., Backworth, in succession to Sir Ronald W. Matthews, J.P., who has resigned owing to extreme pressure of work. Sir Ronald Matthews, however, retains his seat on the boards of these two companies.

Mr. Alexander McKendrick, who was formerly joint managing director of the Glenboig Company with Mr. Kirkby, now becomes sole managing director. These two companies are subsidiaries of General Refractories, Ltd.

"Anti-Splinter" Window Net.

Messrs. Black Bros., Ltd., of Stoney-street, Nottingham, have placed on the market a strong "Anti-Splinter" net which has been included in the Building Research Station list of approved "anti-scatter" treatments for window glass. It is available from stock in 45-yd. lengths, already impregnated with adhesive.

The Building Research Station asks us to correct an error in a Note on "Anti-Scatter Treatments for Glass" (*The Builder*, September 20), in which Messrs. Black Bros.' address is wrongly given. The address is as given above.

A Concrete-armoured Lorry.

The illustration of the concrete-armoured army lorry, shown above, is a further indication of the service which the Building Industry renders the country in war as well as peace.

The history of what has been termed "the Bison Mobile Pill Box" is that when, on the collapse of France, General Ironside was tackling the problem of defence against invasion and required armoured vehicles in numbers, Concrete, Ltd., bought some 420 lorry chassis and built a strange-looking but remarkably effective concrete-armoured lorry of which a later type is shown above. On being shown to one of the Commands, amendments were made to Army requirements, and every Command in the British Army ordered some numbers of these mobile forts for aerodrome defence.

An "Air-Flow" Heater.

In addition to their ordinary patent heating stoves, Tangyes, Ltd., Cornwall Works, Birmingham, are now placing upon the market a new design of heater, which they have designated as the Tangye "Air-Flow" heater. This has been essentially designed to meet particularly cold spots in works where heat cannot be efficiently radiated by the ordinary heating stoves. The heater consists of coke-fired furnaces on which are mounted heat exchange sections. An electric fan blows cold air through these sections, where it is heated and discharged at high velocity and temperature into the building. As approximately 400 cu. ft. of air are passed per minute through the heater, the building is kept at a uniform temperature. The heater consumes from 6 to 18 lb. of coke per hour, depending on the heat output required. Electrical consumption is two units in 12 hours. Full details are obtainable upon request.

DON'T TENDER UNSUCCESSFULLY

SECURE CONTRACTS WITH

BEITA SKEN

THE STEEL SCAFFOLDING CO., LTD.

"BIG BEN TOWERS." 23, OATLANDS DRIVE, WEYBRIDGE, SURREY.

'Phone: Walton-on-Thames 614 and 615.

TENDERS

The Editor welcomes authentic information for this feature from architects, surveyors or contractors. Items should reach 4, Catherine-street, Aldwych, W.C.2, not later than Tuesday morning.

Tenders for A.R.P. work will be found under "A.R.P. Schemes."

* Denotes *accepted.*
† Denotes *provisionally accepted.*
‡ Denotes *recommended for acceptance.*
§ Denotes *accepted subject to modification.*
¶ Denotes *accepted by H.M. Government departments.*

Anglesey.—Porter's lodge at hospital, Bodffordd, for C.C. F. A. Roberts, F.R.I.B.A., architect, Earl-chambs., Mold :—

Owen Evans & Sons, Menai Bridge	£1,177
Parry & Hughes, Llanfechell ...	935
Jones Bros., Llanerchymedd ...	927
J. Jones, Ty Coch, Holyhead ...	860
*G. & J. P. Gregory, 24, High-st., Caernarvon	847

Bath.—Repairs and redecorations at 28, Paragon, for T.C. : *G. Hewitt & Son, £278 15s.

Crawshawbooth.—Extensions, for Rhodeson, Ltd. H. Cropper, A.I.A.A., architect, 2, Holmes-dr., Bacup : *H. Trickett & Son, Ltd., Turton Hollow, Crawshawbooth.

Dagenham.—Chestnut fencing of allotment sites, for T.C. : *Stanford Manufacturing Co., Ltd., £163 9s. 2d.

Durham.—Works for C.C. : Repairs and alterations to buildings at farms, *E. Pye & Son, Bishop Auckland, £450; installation of heating apparatus at central repair depot, *Brightside Foundry and Eng. Co., Ltd., Newcastle-upon-Tyne, £600.

East Boldon.—Internal painting and distempering of administrative block at the smallpox hospital, Whiteleas, near East Boldon. Plans by F. W. Newby : *B. Irwin, 29, St. Mary's-terr., East Boldon.

Hinckley.—Auxiliary fire station, for Moore & Osborne, Ltd. Heaton & Walker, architects, Barclays Bank-chams. : *J. H. Mason & Son, Ltd., Factory-rd, Hinckley.

Huntingdon.—Certain structural repairs to two pairs of houses, for R.D.C. W. A. Lea, F.R.I.B.A., architect, 4, Market-hill : *M. J. Allen & Sons, Ltd., Brampton, Huntingdon, £670.

Lancashire.—Works for E.C. : alterations to heating apparatus at Middleton Grammar School, *J. Blake, Ltd., Accrington, £298 15s. 4d.; alterations at Prescot Zion Independent Methodist school, *J. Pinnington & Sons, Roby, Liverpool, £274 3s. 6d.; external painting, Leigh Municipal technical college, *W. H. Radcliffe & Co., Walkden, £170; external painting, Rivington and Blackrod grammar school, *A. Sharrocks, 229, Spotland-rd., Rochdale, £134 11s. 2d.; internal decorations at Horwich Railway Mechanics' institute and technical college, *J. J. Evans & Sons, 172, Bolton-rd., Walkden, £273.

London (Air Ministry).—Contracts to the value of £500 or over placed for week ended Nov. 2 :—

General maintenance work : J. F. Booth & Son, Banbury; Harry Neal, Ltd., Northwood; A. Mason (Contractors), Ltd., Mansfield; Janes (Builders), Ltd., Slough; John Moar & Sons, Birsay, Orkneys; and Jas. Alexander & Sons, Galston, Ayrshire.

Electrical work : Electrical Installations, Ltd., London; Liverpool Electric Cable Co., Ltd., Liverpool; and Jas. Scott & Co., Dunfermline.

Civil engineering work : Thos. Swan & Co., Ltd., Chorley Wood, Herts; Tarslag, Ltd., Wolverhampton; A. Monk & Co., Ltd., Warrington; L. J. Speight & Partners, Ltd., Thatcham, Newbury; and Constable, Hart & Co., Ltd., London.

Building and civil engineering work : John Mowlem & Co., Ltd., London.

Heating work : J. Jeffreys & Co., Ltd., London; Brightside Foundry and Engineering Co., Ltd., Birmingham; and G. N. Haden & Sons, Ltd., London.

Structural steelwork : Wright, Anderson & Co., Ltd., Gateshead.

London (War Dept.).—Works contracts placed for week ended Nov. 2 :—

Building work : Cussins (Contractors), Ltd., Moor-court, Gosforth, Newcastle-on-Tyne, 3; A. Holmes & Sons, Ltd., 811-813, London-rd., Derby; Wright & Kellett, Ltd., Finchdale-terr., Chester-le-Street; Wates, Ltd., Piddlehinton, near Dorchester; and R. Carse & Son, Ltd., Amble.

Hutting : R. Cleminshaw, Ltd., 103, Westparade, Spring Bank, Hull; and Tanhouse Estates Building and Development Co., Hamstead-rd., Great Barr, Birmingham.

Miscellaneous work : G. Dougill & Son, Ltd., Chesnut-st., Darlington; Herbert Morris, Ltd., Loughborough; and Charles Dick & Son, Dick-st., Monifieth, Angus.

Hutments : Staverton Builders, Ltd., Staverton, Totnes; and Angus M. MacDougall & Co., Ltd., 24-26, Davaar-st., Glasgow.

Hutting (erection) : W. G. Northcot & Co., Ltd., Beacon-view, Whipton, Exeter; W. Mulcaster & Co. (Contractors), Ltd., Haslington, Crewe; C. Cornes & Son, Lichfield-st. Works, Hanley (two contracts); Geo. Hodges & Son, Ltd., Horninglow-st., Burton-on-Trent; H. Laverty & Sons (Belfast), Ltd., 12-14, Cambridge-st., Belfast; and Courtney & Co., Shaftesbury-av., Ormeau-rd., Belfast.

London.—Provision of four steel-pipe supporting trusses, for M.W.B. : *H. J. Horswell & Son., Ltd., £272 3s.

Richmond (Yorks).—Building to house chlorination plant, for R.D.C. : *L. Hutchinson, Richmond, £132.

Sheffield.—(1) Builders' work and (2) additional apparatus in boiler-house, for heating system at City General Hospital, for Health Committee. W. George Davies, F.R.I.B.A., City Architect : (1) *Public Works Dept. of Corporation, £498 10s.; (2) *Bennis Combustion, Ltd., £2,251 10s.

Smethwick.—Renewal of electrical installations at a fire station, for T.C. : *Shropshire, Worcestershire and Staffordshire Electric Power Co., Mucklow Hill, Halesowen. (Estimated cost, £700.)

Southall.—Fifty shelters of different types, for T.C. :—

G. Wood, Ltd.	£3,827	12	6
Spiers, Ltd.	3,663	2	6
A. Robinson	3,523	5	0
Vibrated Concrete Construction	3,455	0	0
G. H. Burgess, Ltd. ...	3,357	10	0
Bunting Construction ...	3,383	4	7
Walker (Tooting), Ltd. ...	3,287	10	0
W. H. Gaze & Sons ...	3,282	12	11
Raglan Building Co. ...	3,106	0	0
*Balls & Partners	3,060	0	0
*Percy Bilton, Ltd.	3,047	11	3
*Grainger & Apthorpe ...	3,037	9	7

(*To divide contract.)

Staffordshire.—Widening of Fauld-la., near Tutbury, for a distance of 1,900 yds., for C.C. C.S., Stafford : *Kenyon Phillips, Ltd., Park-rd., Coleshill.

Stockport.—Erection of proposed junior and infants' school, South Reddish, for E.C. Cruickshank & Seward, architects, 14, Princess-st., Manchester, 1 : *T. Davies & Son (Contractors), Ltd., Croft Mill, Turncroft-la., Stockport, £10,826.

Sunderland.—Conversion of garage into a bakery, for Messrs. Miller : *Coutts & Findlater, 15, Hudson-rd., Sunderland.

Walthamstow.—Works for T.C. : Resurfacing bitumen painting and making good playgrounds at various schools, *E. C. MacDermot & Co.; external repairs at schools, *J. & J. Dean, Ltd.

Warwick.—Sanitary conversions to 24 council houses and laying water mains, for R.D.C. : *Clarke Bros., Whitenash-rd., Leamington Spa, £220.

Wolverhampton.—New mortuary, for T.C. : *H. Willcock & Co., Ltd., Wolverhampton, £3,984. (In lieu of previous tender.)

Worthing.—Installation of heating and lighting in school air-raid shelters, for T.C. : *Phillips & Dart, Ltd., £647; *H. J. Galliers, £273 18s.; *F. Sandell & Sons, Ltd., £144 1s. 10d.

FLOORINGS
'phone
BAYswater 0163
or send your enquiry for
Wood Block, T & G Strip, Parquet (in various designs)
and Composition Floorings.
TO
TURPINS PARQUET FLOORING Co. Ltd.
25 NOTTING HILL GATE, W.11
Established 1866

HOSPITAL & SCHOOL STOVES
SOLE MAKERS OF
WRIGHT'S IMPROVED AND ALSO SHORLAND'S PATENT WARM AIR VENTILATING PATTERNS.
GEO. WRIGHT (LONDON) LTD
19 NEWMAN ST. OXFORD ST. LONDON, W.1.

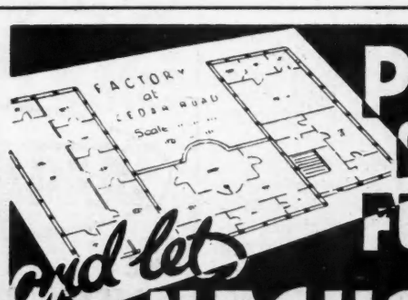
Boyle's Patent "Air-Pump" Ventilator
OVER TWO MILLION IN USE.
ROBERT BOYLE & SON,
Ventilating Engineers, 65, HOLBORN VIADUCT, LONDON, E.C.1. Tel. Central 4583.

ROADS LIVERSEDGE INTERWOVEN HIGH TENSILE STEEL FABRIC STRUCTURES
The Liversedge Reinforced Concrete Engineering Co. Ltd.
15, Breams Buildings, E.C.4. Tel.: Hol. 3718, 6467

THE LONDON & LANCASHIRE INSURANCE Co LTD
INSURANCES ON BUILDINGS in course of ERECTION
LOWEST RATES
Head Offices:
155, LEADENHALL ST., LONDON, E.C.2
45, DALE ST., LIVERPOOL.
Chief Administration:
7, CHANCERY LANE, LONDON, W.C.

BUY BRITISH
FLOORINGS
WOOD BLOCK PARQUET
SOLID T & G HARDWOOD
PANELLING
POINT PLEASANT LONDON S.W.18
Stevens & Adams Ltd.
PHONE PUTNEY 5611 (6 lines)

for Walls . Ceilings . Dadoes FACTORIES . CAMPS HUTMENTS . ETC. . . .
MILLS U.S.A. & FINLAND
INSULITE
INSULATING BOARD & HARDBOARD
TELEPHONE : MANSION HOUSE 5351
PHARAOHS (DISTRIBUTORS) LTD.
ADELAIDE HOUSE · LONDON BRIDGE · E.C.4



PLAN for the FUTURE and let NEGUS build it!
W. & M. NEGUS, LTD.,
Station Works, King James St., Southwark, S.E.1. WAT. 5474.